

3. Place the Estimating Using Lead Digit transparency on the overhead.

- Read the definition at the top of the page together.
- Have a student estimate the first problem using lead digit and explain his/her thinking orally. Record the lead digit estimate. Then ask students to find the exact sum. Record the exact sum.

<u>Estimate</u>	<u>Exact</u>
1) $\begin{array}{r} \boxed{2}4 \\ 51 \\ +10 \\ \hline 80 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 10px;"> Lead digit is 2. Lead digit is 5. Lead digit is 1. Lead digit estimate. </div>	$\begin{array}{r} 24 \\ 51 \\ +10 \\ \hline 85 \end{array}$

- Point to the exact sum and ask students if they think this answer is reasonable and why. (Help students to understand that they can use their estimate to judge the reasonableness of the answer. Since 85 is close to the estimate of 80, it is a reasonable answer.)
- Repeat this same procedure with problems 2 and 3. (**Note:** Be sure to point out that two 0s need to be filled in as place holders in problem 3. See example below.)

<u>Estimate</u>	<u>Exact</u>
2) $\begin{array}{r} \boxed{7}2 \\ 04 \\ +23 \\ \hline 90 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 10px;"> Lead digit is 7. Fill in 0 as lead digit. Lead digit is 2. Lead digit estimate. </div>	$\begin{array}{r} 72 \\ 4 \\ +23 \\ \hline 99 \end{array}$
3) $\begin{array}{r} \boxed{3}41 \\ 023 \\ +005 \\ \hline 300 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 10px;"> Lead digit is 3. Fill in 0 as lead digit. Fill in <u>two 0s</u>. Lead digit estimate. </div>	$\begin{array}{r} 341 \\ 23 \\ +5 \\ \hline 369 \end{array}$

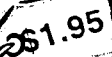
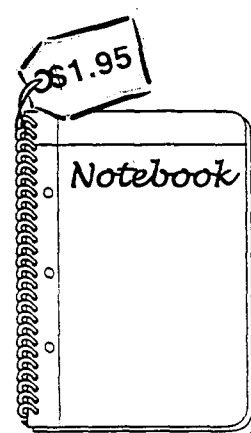
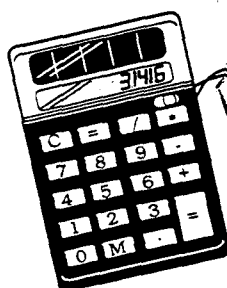
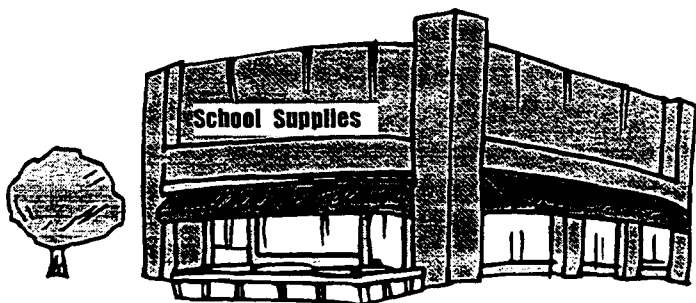
- To introduce lead digit estimation with subtraction, point to problem 4 . Say “ We can also estimate using lead digit with subtraction.” Repeat the process of identifying the lead digits, then have students subtract to find lead digit estimate.

4) $\begin{array}{r} \boxed{8}75 \\ -402 \\ \hline 400 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 10px;"> Lead digit is 8. Lead digit is 4. Lead digit estimate. </div>	$\begin{array}{r} 875 \\ -402 \\ \hline 473 \end{array}$
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- Practice problems are provided on the worksheet Working with Lead Digits.
- Additional practice using lead digit estimation is provided on the Problem Solving with Estimation activity sheet.

Check answers together and encourage students to verbalize their thinking. Encourage use of lead digit estimation throughout the year as a way to check reasonableness of computation.

Tran Goes Shopping

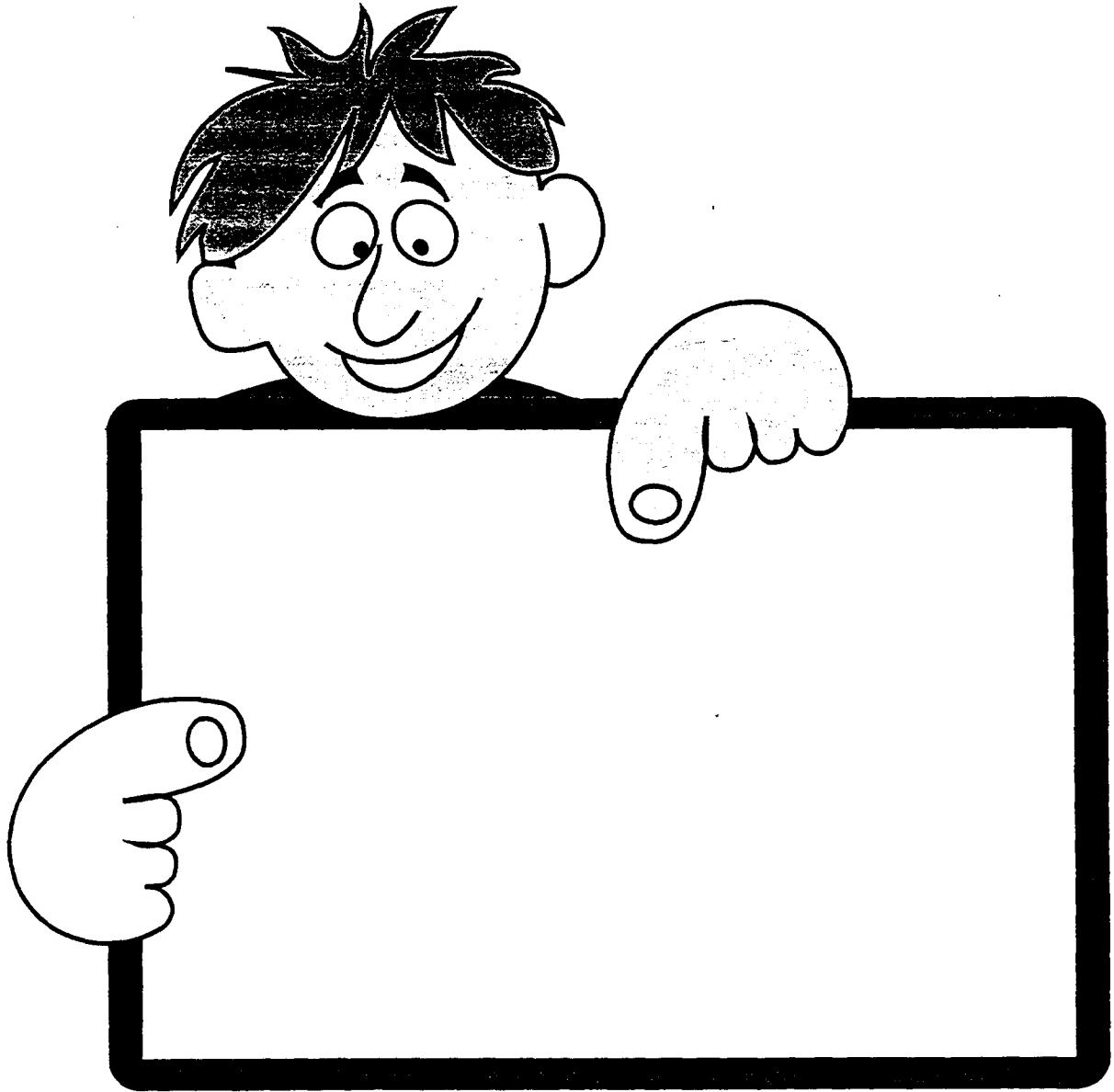


Name: _____

Thinking About Lead Digit Estimation

Think about a time when you might need to estimate.
Write about your experiences.

- 1) Where are you?
- 2) What will you buy?
- 3) Show with numbers how you use lead digit estimation to see if you will have enough money.



Estimating Using Lead Digit

Remember: We use lead digit to help us estimate quickly.

To estimate a sum or difference using **lead digit**:

- 1) Find the **first** digits - the **front** or **lead** digits.
- 2) Add **zeroes** to mark missing lead digits and other place values.
- 3) **Add** or **subtract** the lead digits.
- 4) Check to see if your answer is **reasonable**.

Estimate

Exact

$\begin{array}{r} 24 \\ 51 \\ + 10 \\ \hline \end{array}$	Lead digit is ____ Lead digit is ____ Lead digit is ____	$\begin{array}{r} 24 \\ 51 \\ + 10 \\ \hline \end{array}$
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Lead digit estimate

Estimate

Exact

$\begin{array}{r} 341 \\ 023 \\ + 005 \\ \hline \end{array}$	Lead digit is ____ Fill in 0 as lead digit. Fill in two 0s.	$\begin{array}{r} 341 \\ 23 \\ + 5 \\ \hline \end{array}$
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Lead digit estimate

Estimate

Exact

$\begin{array}{r} 72 \\ 04 \\ + 23 \\ \hline \end{array}$	Lead digit is ____ Fill in 0 as lead digit. Lead digit is ____	$\begin{array}{r} 72 \\ 4 \\ + 23 \\ \hline \end{array}$
---	--	--

Lead digit estimate

Estimate

Exact

$\begin{array}{r} 875 \\ - 402 \\ \hline \end{array}$	Lead digit is ____ Lead digit is ____	$\begin{array}{r} 875 \\ - 402 \\ \hline \end{array}$
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Lead digit estimate

Name: _____

Working with Lead Digits

Estimate the sums or differences using lead digits. Then, find an exact answer.

(Be sure to compare your answers to check your estimate.)

Estimate

Exact

Estimate

Exact

1)

$$\begin{array}{r} 415 \\ + 350 \\ \hline \end{array}$$

$$\begin{array}{r} 415 \\ + 350 \\ \hline \end{array}$$

6)

$$\begin{array}{r} 86 \\ - 51 \\ \hline \end{array}$$

$$\begin{array}{r} 86 \\ - 51 \\ \hline \end{array}$$

2)

$$\begin{array}{r} 15 \\ 50 \\ + 24 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ 50 \\ + 24 \\ \hline \end{array}$$

7)

$$\begin{array}{r} 374 \\ - 154 \\ \hline \end{array}$$

$$\begin{array}{r} 374 \\ - 154 \\ \hline \end{array}$$

3)

$$\begin{array}{r} 511 \\ 3 \\ + 31 \\ \hline \end{array}$$

$$\begin{array}{r} 511 \\ 3 \\ + 31 \\ \hline \end{array}$$

8)

$$\begin{array}{r} 839 \\ - 25 \\ \hline \end{array}$$

$$\begin{array}{r} 839 \\ - 25 \\ \hline \end{array}$$

4)

$$\begin{array}{r} 124 \\ 605 \\ + 270 \\ \hline \end{array}$$

4)

$$\begin{array}{r} 124 \\ 605 \\ + 270 \\ \hline \end{array}$$

9)

$$\begin{array}{r} 547 \\ - 206 \\ \hline \end{array}$$

$$\begin{array}{r} 547 \\ - 206 \\ \hline \end{array}$$

5)

$$\begin{array}{r} 10 \\ 43 \\ 24 \\ + 2 \\ \hline \end{array}$$

5)

$$\begin{array}{r} 10 \\ 43 \\ 24 \\ + 2 \\ \hline \end{array}$$

10)

$$\begin{array}{r} 488 \\ - 351 \\ \hline \end{array}$$

$$\begin{array}{r} 488 \\ - 351 \\ \hline \end{array}$$

Name _____

Problem Solving with Estimation

Use lead digit to estimate in the following problems. Then, find the exact amount.

1)

Marta went shopping for food. There were many things on sale!

Estimate

Exact

- 1) **About** how much do you think she saved at the store today?
- 2) Find the **exact** amount she saved.



2)

Our principal, Mr. Singh, needs 103 kids to help decorate the school for the big party. The fifth grade class has 32 students who can help. The third grade class has 43 helpers. The eighth grade has 20 students who can help, and the seventh grade has 4 student helpers.

Estimate

Exact

- 1) **About** how many students can help?
- 2) **Exactly** how many students can help?
- 3) Will Mr. Singh have enough helpers?
- 4) If not, how many more does he need?



3)

Dena got \$799 for her birthday. She wants to go on a vacation to Disneyworld. The trip will cost \$453.

Estimate

Exact

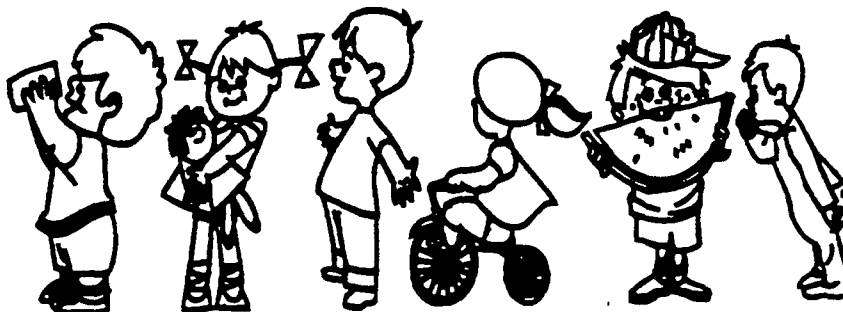
- 1) **About** how much money will Dena have left after she pays for the trip?
- 2) **Exactly** how much will she have left?
- 3) If she has money left over, what do you think she could buy with it and how much would it cost?

What Would She Buy?

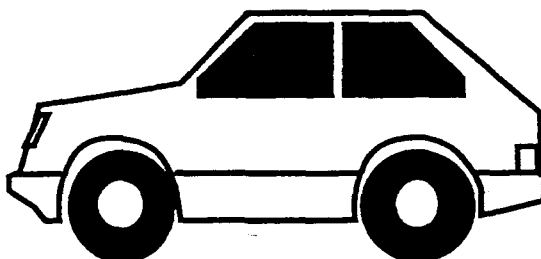


Lead or Front First

The **first** person in line is at the **front** of the line.



The **front** of the car moves forward **first**.



Students enter the school using the **front** door.



Objective 7: Add 2-digit and 3-digit numbers with regrouping.

Vocabulary

combine
regroup
addend

Materials

overhead base ten blocks
base ten blocks
number cubes

Student Copies:

Place Value Boards (TR)
Ready to Regroup
2-Digit Addition
Let's Add Some More!
3-Digit Addition
Fun With Addition
Can You Explain?
Pick a Number
Using Data From a Chart to Solve Problems

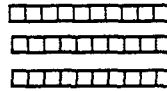
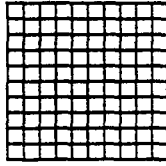
Language Foundation

1. "Re" is a prefix meaning "again". Explain to students that in this lesson, **regroup** means to make the group again or to combine the group in a different way. As an example, ask a number of students to come up to the front of the class. Form two groups with the students. Now rearrange the students to form two different groups using the same students. Be sure to point out to the class that you have regrouped the students, but that the number of students is the same.
2. The concept of regrouping is established in this lesson. Students need many opportunities to carry out the addition process using concrete materials. They should then move to the recording process, relating it to what they are doing concretely. It is important that they be able to demonstrate understanding of the process through use of concrete referents.

In this lesson, a visual basis for regrouping is developed using base ten blocks. First, the focus is on joining one group to another and exchanging ten ones for a ten when appropriate. When they play The Trading Game, they are adding blocks and regrouping to reach a goal. Finally, students relate the formal algorithm to the manipulation of the blocks before moving on to the use of the algorithm alone.

Mathematics Component

Warm-Up: Review the use of base ten blocks by representing several numbers on the overhead. For each number have students name the blocks, read the number orally, and write the number on paper. For example:



Blocks

Oral

Written

one hundred, three tens, and four ones

one hundred thirty-four

134

Have students come up to the overhead and use transparent base ten blocks to represent different numbers, some that are given orally and some that are written. Be sure to include numbers with zeros in different positions such as 305, 240, 103, and 260.

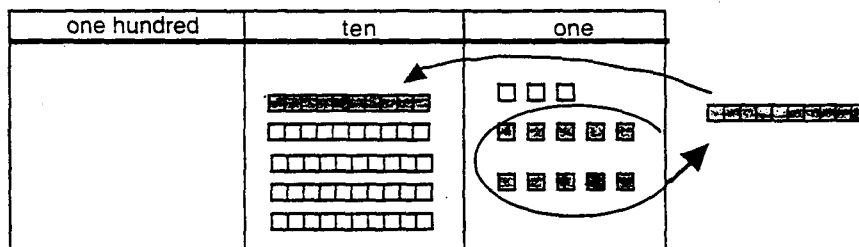
1. Distribute Place Value Boards (TR) and base ten blocks to each pair of students.
 - Have one student in each pair represent 38 near the top of the Place Value Board as you model on the overhead. Describe the number 38 as three tens and eight ones.
 - Ask the second student to represent 15 near the bottom of the board. Model on the overhead. Describe the number 15 as one ten and five ones.

one hundred	ten	one	
			← 38
			← 15

- Tell students that you want to combine or add these two numbers. Model pushing all of the tens together and then pushing all of the ones together. Have students do the same.
- Record the addition problem beside the mat.

one hundred	ten	one	
			38
			+15

- Point to the overhead and say, "I added 38 and 15. How many ones do I have altogether?" (13) Show students that there are 8 ones in 38 and 5 ones in 15 making a total of 13 ones.
- Review that ten ones are equal to a rod. Ask students if there is a way to regroup the ones in this new number. (Yes, ten ones can be regrouped for a rod.) Ask students to regroup on their boards.
- Have one student come up to the overhead and model as they describe the regrouping of ten ones for one rod (10).



- Have students name the new number of ones and tens. (5 tens and 3 ones)
- Go back to the problem written beside the board and record the trading process as shown below.

$$\begin{array}{r} 1 \\ 38 \\ + 15 \\ \hline 3 \end{array}$$

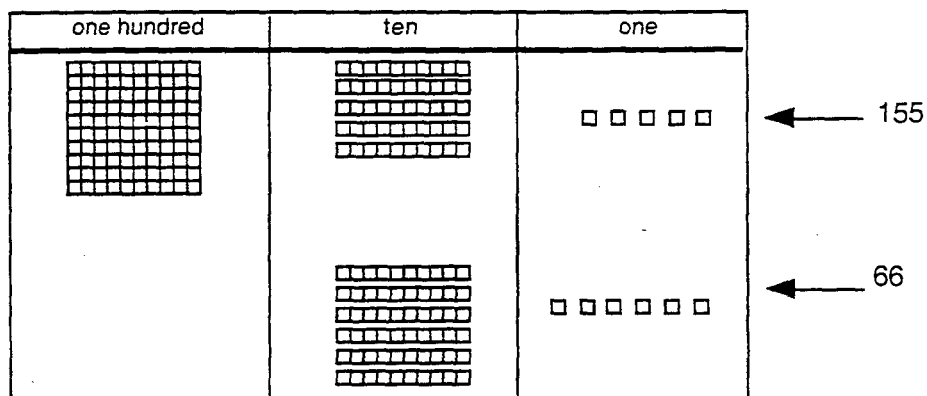
Ten ones are regrouped and placed with the tens as a rod.
Three ones remain.

- Ask students to count the number of tens on the board. (5) Record the 5 tens symbolically in the problem.

$$\begin{array}{r} 1 \\ 38 \\ + 15 \\ \hline 53 \end{array}$$

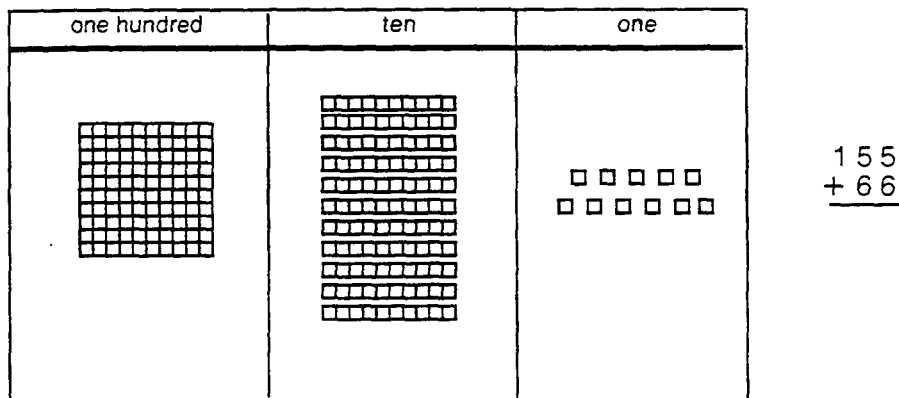
- Say, "The sum of 38 and 15 is 53. Verify that the answer is 53 by pointing to and counting the blocks on the board, starting with the rods and then moving to the ones. "Ten, twenty, thirty, forty, fifty... one, two, three. **Fifty-three.**"
2. Use the following problem to expand the process to three-digit numbers. Have students work with partners to show the process on Place Value Boards as you model on the overhead.

- Ask students to represent 155 near the top of their boards and 66 near the bottom of their boards.

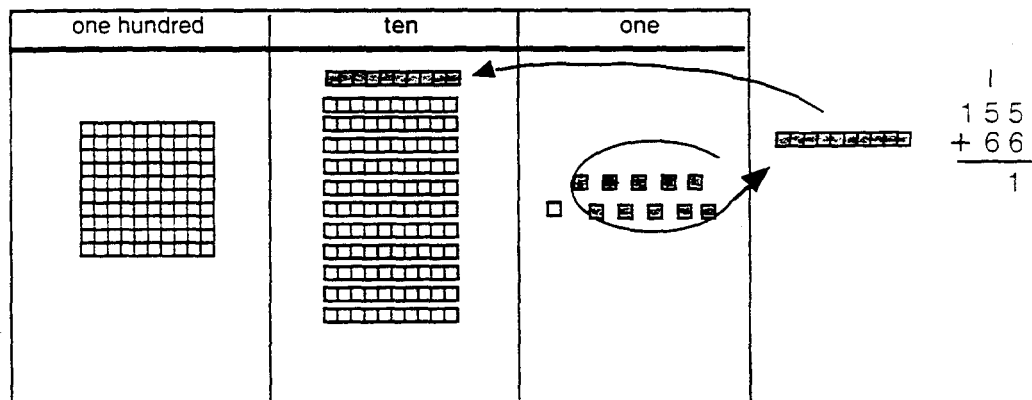


- Have students discuss and write each step as the blocks are added and regrouped.

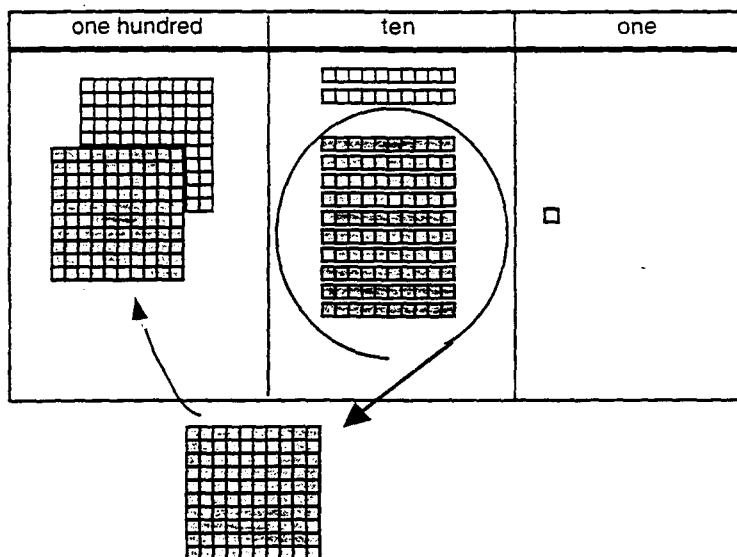
1) Add the blocks together.



2) Regroup ten ones for a rod. (1 one is left.)

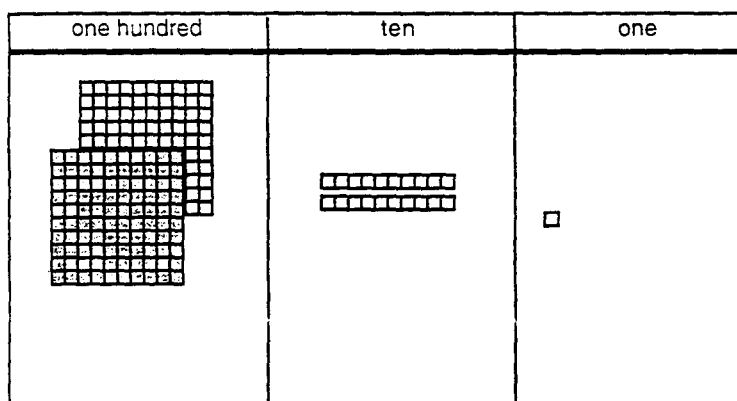


3) Regroup ten rods for a flat. (Two tens are left.)



$$\begin{array}{r} 11 \\ 155 \\ + 66 \\ \hline 221 \end{array}$$

4) Add all the blocks together.



$$\begin{array}{r} 11 \\ 155 \\ + 66 \\ \hline 221 \end{array}$$

- Have students work in pairs, using base ten blocks, to model and record the following addition problems. When finished, check answers by having different students model the correct solutions on the overhead.

$$\begin{array}{r} 64 \\ + 37 \\ \hline \end{array}$$

$$\begin{array}{r} 58 \\ + 24 \\ \hline \end{array}$$

$$\begin{array}{r} 168 \\ + 39 \\ \hline \end{array}$$

$$\begin{array}{r} 254 \\ + 79 \\ \hline \end{array}$$

$$\begin{array}{r} 198 \\ + 162 \\ \hline \end{array}$$

3. For additional reinforcement of regrouping, students may play a whole-class game called The Trading Game.

- Pass out individual Place Value Boards and sets of base ten blocks. Model the first rounds of the game on the overhead.
- Toss a number cube and ask students to place that number of blocks on their boards.

- Toss the number cube again and ask students to add that number of blocks to their boards.
 - Ask students if any blocks can be regrouped. If so, demonstrate regrouping ten ones for a rod.
 - Tell students that you will continue to toss the number cube and each time, students should add that number of blocks to their boards.
 - Explain that each time they add blocks, they should check to see if any regrouping is possible. If so, they should regroup. Tell them that you will not let them know if regrouping is possible, they must watch and regroup when they can. They may need to regroup ones or tens.
 - Set a goal, such as 100 or 200, and tell students that the first one to reach the goal is the winner.
4. Additional practice with addition using regrouping is provided on the following activity sheets. Ready to Regroup, 2-Digit Addition, Let's Add Some More!, Fun With Addition, 3-Digit Addition, Can You Explain How?, Pick A Number, Using Data From a Chart to Solve Problems.

Can your Explain How? gives students language practice by allowing them to explain in their own words their thinking in setting up and solving an addition problem. Urge students to use math vocabulary that they have learned such as “line up” and “regroup” in their explanations.

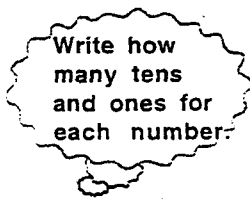
Pick A Number encourages oral language and promotes creativity as students work in pairs to create their own problems and check others' work.

Problem Solving

The activity sheet Using Data From a Chart ... provides student practice in reading data from a chart and using that data to answer questions and solve problems using addition.

Name: _____

Ready to Regroup



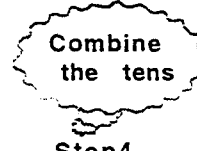
Step 1



Step 2



Step 3



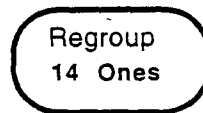
Step 4

Example: 35 and 19

Tens	Ones
3	5
1	9



14 Ones



1 Tens 4 Ones

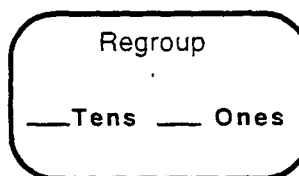
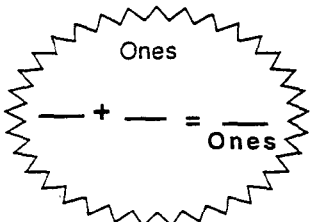
Tens	Ones
5	4

3 tens
1 ten
1 ten
5 tens

Practice regrouping. Use blocks to help.

1) 68 and 14

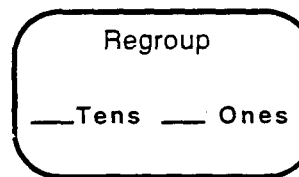
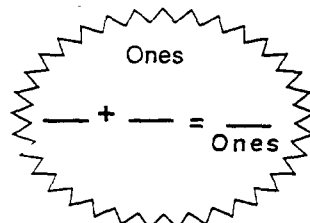
Tens	Ones



Tens	Ones

2) 49 and 22

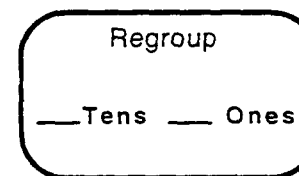
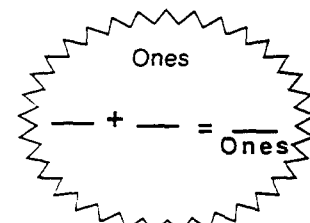
Tens	Ones



Tens	Ones

3) 36 and 39

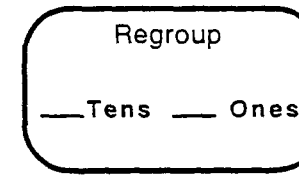
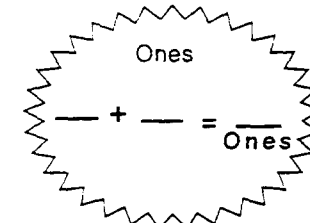
Tens	Ones



Tens	Ones

4) 57 and 17

Tens	Ones




Tens	Ones

Name: _____

2-Digit Addition

Let's add 15 and 27.


First add the ones.



$$\begin{array}{r} 15 \\ + 27 \\ \hline \end{array}$$

12 ones


Regroup if you need to



$$\begin{array}{r} \boxed{1} \\ 15 \\ + 27 \\ \hline \end{array}$$

12

Then add the tens.



$$\begin{array}{r} \boxed{1} \\ 15 \\ + 27 \\ \hline 42 \end{array}$$

Now, practice adding. Use blocks to model if you need help.

1)

$$\begin{array}{r} \boxed{} \\ 37 \\ + 28 \\ \hline \end{array}$$

ones

2)

$$\begin{array}{r} \boxed{} \\ 19 \\ + 56 \\ \hline \end{array}$$

ones

3)

$$\begin{array}{r} \boxed{} \\ 74 \\ + 18 \\ \hline \end{array}$$

ones

4)

Tens	Ones
$\boxed{}$	
5	7
+ 1	5
<hr/>	
$\boxed{}$	$\boxed{}$

5)

Tens	Ones
$\boxed{}$	
3	6
+ 2	8
<hr/>	
$\boxed{}$	$\boxed{}$

6)

Tens	Ones
$\boxed{}$	
7	1
+ 1	9
<hr/>	
$\boxed{}$	$\boxed{}$

7)

Tens	Ones
$\boxed{}$	
2	2
+ 4	9
<hr/>	
$\boxed{}$	$\boxed{}$

8)

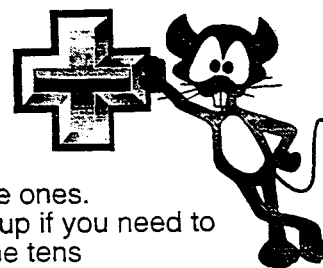
Tens	Ones
$\boxed{}$	
6	3
+ 2	9
<hr/>	
$\boxed{}$	$\boxed{}$

9)

Tens	Ones
$\boxed{}$	
5	7
+ 8	
<hr/>	
$\boxed{}$	$\boxed{}$

Name: _____

Let's Add Some More!



Find the sum. Use models to help. Remember the steps: 1) Add the ones.
2) Regroup if you need to
3) Add the tens

$$\begin{array}{r} 1) \quad 37 \\ + 35 \\ \hline \end{array}$$

$$\begin{array}{r} 2) \quad 62 \\ + 18 \\ \hline \end{array}$$

$$\begin{array}{r} 3) \quad 19 \\ + 18 \\ \hline \end{array}$$

$$\begin{array}{r} 4) \quad 45 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5) \quad 15 \\ + 76 \\ \hline \end{array}$$

$$\begin{array}{r} 6) \quad 33 \\ + 25 \\ \hline \end{array}$$

$$\begin{array}{r} 7) \quad 54 \\ + 37 \\ \hline \end{array}$$

$$\begin{array}{r} 8) \quad 87 \\ + 13 \\ \hline \end{array}$$

$$\begin{array}{r} 9) \quad 12 \\ 53 \\ + 47 \\ \hline \end{array}$$

$$\begin{array}{r} 10) \quad 45 \\ 56 \\ + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 11) \quad 8 \\ 70 \\ + 24 \\ \hline \end{array}$$

$$\begin{array}{r} 12) \quad 40 \\ 75 \\ + 19 \\ \hline \end{array}$$

$$\begin{array}{r} 13) \quad 12 \\ 53 \\ + 47 \\ \hline \end{array}$$

$$\begin{array}{r} 14) \quad 70 \\ 32 \\ + 18 \\ \hline \end{array}$$

$$\begin{array}{r} 15) \quad 90 \\ 4 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 16) \quad 48 \\ 35 \\ + 10 \\ \hline \end{array}$$

$$17) \quad 53 + 28$$

$$18) \quad 15 + 76$$

$$19) \quad 83 + 28$$

$$20) \quad 42 + 11 + 37$$

$$21) \quad 84 + 13 + 10$$

$$22) \quad 21 + 19 + 66$$

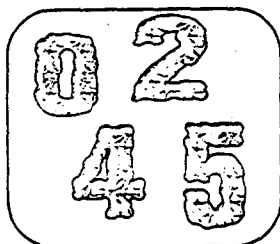
Name: _____

Fun With Addition



Addition Puzzle

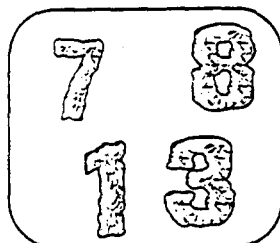
- Work with a partner.
- Use the numbers in the box to write the addends that equal each sum.
- Be sure to use the numbers in the box only once in each problem.



$$\begin{array}{r} 20 \\ + 45 \\ \hline 65 \end{array}$$

$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 92 \end{array}$$

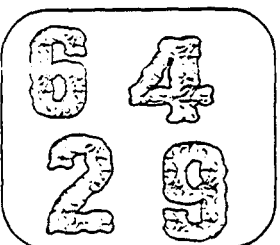
$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 74 \end{array}$$



$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 55 \end{array}$$

$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 91 \end{array}$$

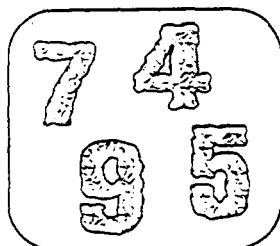
$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 118 \end{array}$$



$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 111 \end{array}$$

$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 138 \end{array}$$

$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 93 \end{array}$$



$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 124 \end{array}$$

$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 142 \end{array}$$

$$\begin{array}{r} \underline{\quad} \\ + \underline{\quad} \\ \hline 133 \end{array}$$

Name: _____

3-Digit Addition

Step 1
Add the ones.
Regroup if you can.

$$\begin{array}{r} 486 \\ + 217 \\ \hline \end{array}$$

(A box with '1' is above the 8, and a circle around the 6 and 7 shows a regroup to 3 in the tens place.)

Step 2
Add the tens.
Regroup if you can.

$$\begin{array}{r} 486 \\ + 217 \\ \hline \end{array}$$

(A box with '1' is above the 8, and a circle around the 18 and 7 shows a regroup to 0 in the tens place and 1 in the hundreds place.)

Step 3
Add the hundreds.

$$\begin{array}{r} 486 \\ + 217 \\ \hline \end{array}$$

(A box with '1' is above the 4, and a circle around the 7 and 2 shows a regroup to 0 in the tens place and 1 in the hundreds place.)

Warm up with models. Count the blocks, then record and solve the problem.

Model for 486 + 217:

486 is represented by 4 hundreds blocks, 8 tens rods, and 6 units cubes.

217 is represented by 2 hundreds blocks, 1 ten rod, and 7 units cubes.

Regrouping: 1 ten rod is moved from the 886 group to the 217 group, making 5 hundreds blocks and 7 tens rods.

Sum: 703

Model for 581 + 394:

581 is represented by 5 hundreds blocks, 8 tens rods, and 1 unit cube.

394 is represented by 3 hundreds blocks, 9 tens rods, and 4 unit cubes.

Regrouping: 1 ten rod is moved from the 881 group to the 394 group, making 6 hundreds blocks and 7 tens rods.

Sum: 975

Find the sum.

1)
$$\begin{array}{r} 154 \\ + 328 \\ \hline \end{array}$$

2)
$$\begin{array}{r} 220 \\ + 694 \\ \hline \end{array}$$

3)
$$\begin{array}{r} 581 \\ + 86 \\ \hline \end{array}$$

4)
$$\begin{array}{r} 307 \\ + 465 \\ \hline \end{array}$$

5)
$$\begin{array}{r} 26 \\ + 575 \\ \hline \end{array}$$

6)
$$\begin{array}{r} 300 \\ + 891 \\ \hline \end{array}$$

7)
$$\begin{array}{r} 684 \\ + 126 \\ \hline \end{array}$$

8)
$$\begin{array}{r} 860 \\ + 100 \\ \hline \end{array}$$

9)
$$\begin{array}{r} 619 \\ + 92 \\ \hline \end{array}$$

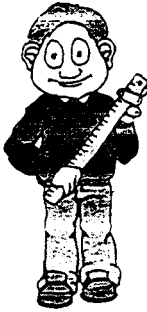
10)
$$\begin{array}{r} 5 \\ + 945 \\ \hline \end{array}$$

11)
$$\begin{array}{r} 321 \\ + 399 \\ \hline \end{array}$$

12)
$$\begin{array}{r} 652 \\ + 81 \\ \hline \end{array}$$

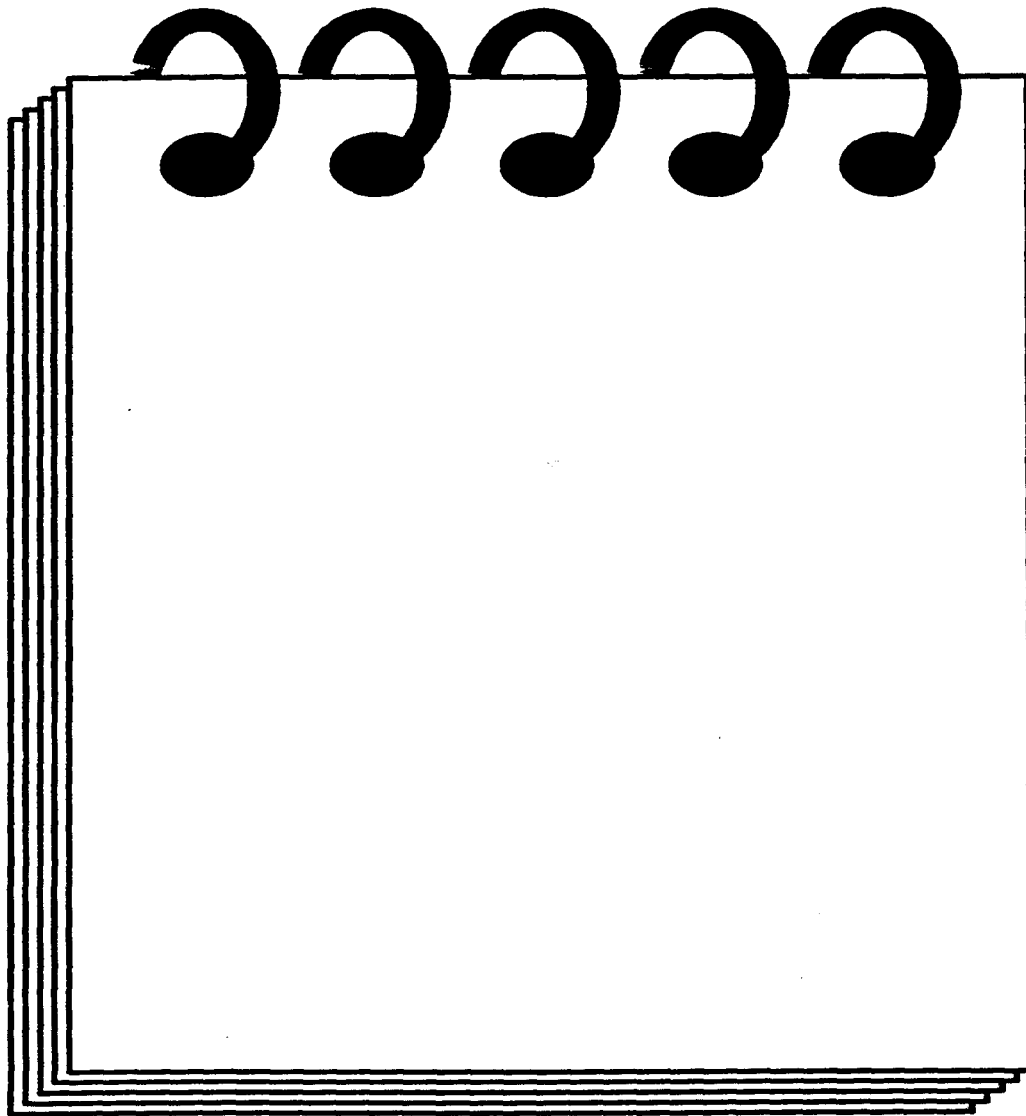
Name: _____

Can You Explain How ?



Your little sister needs help with her math homework.
Tell her how to add these numbers? $26 + 17 + 3$

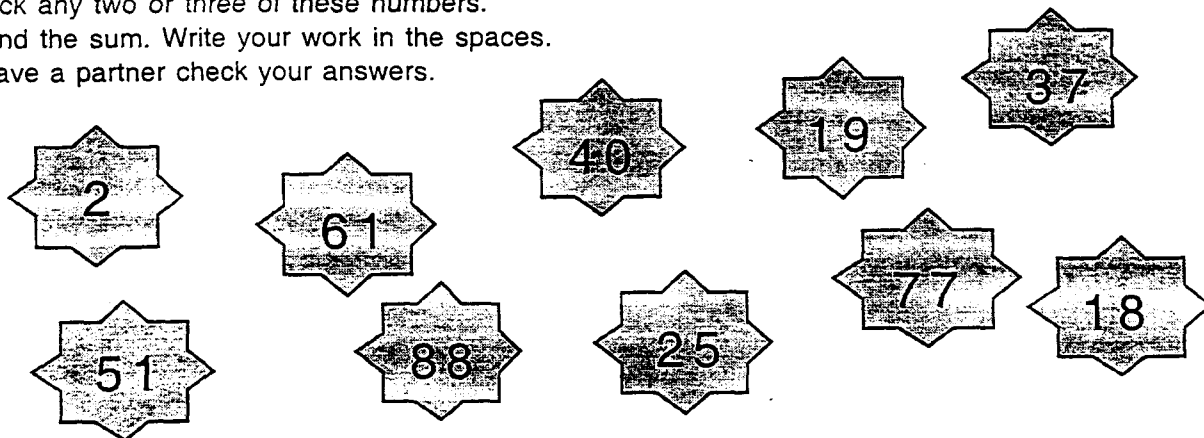
- 1) Write what you would say to your sister.
- 2) Draw some pictures or models to help explain.



Name: _____

Pick A Number

Pick any two or three of these numbers.
Find the sum. Write your work in the spaces.
Have a partner check your answers.



1)

+ _____

2)

+ _____

3)

+ _____

4)

+ _____

5)

+ _____

6)

+ _____

When you add two of the numbers in the stars up above, what is the largest sum you can make?

$$\star + \star = \underline{\hspace{2cm}}$$

What is the smallest sum you can make?

$$\star + \star = \underline{\hspace{2cm}}$$



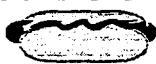


When you add three of the numbers in the stars up above, what is the largest sum you can make?

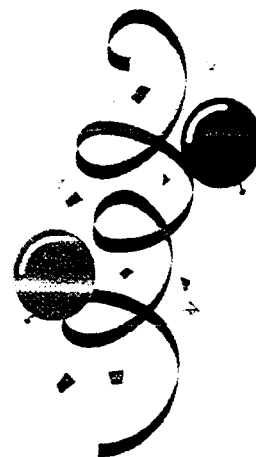
$$\star + \star + \star = \underline{\hspace{2cm}}$$

Name: _____

Using Data From a Chart to Solve Problems

Pablo and Irena are helping make food for a party.
Read the chart to find information and then answer the questions.

Food the Kids Made		Pablo	Irena
 Cookies		12	23
 Cupcakes		18	20
Hot Dogs 		7	35
 Tacos		26	49
Candy Apples 		19	5



Use the chart and write the numbers. Solve the problems.

- 1) Pablo made _____ tacos. Irena made _____ tacos.
How many tacos did they make all together? _____ tacos.
- 2) Irena made _____ candy apples. Pablo made _____ candy apples.
What is the sum of all the candy apples made by the kids? _____
Who made more candy apples? _____
- 3) Did Pablo and Irena make more cupcakes or cookies? How do you know?
- 4) Who made fewer hot dogs? _____
What was the total number of hot dogs cooked? _____

Objective 8: Model, record, and subtract 2-digit and 3-digit numbers with regrouping.

Vocabulary

subtract
take away
from
reduce by
left
remain
how many
minus
difference
regroup

Materials

base ten blocks
transparent markers

Transparencies:

The Soccer Game
Place Value Board
Make a Path

Student Copies:

Subtraction With 2-Digit Numbers
More Practice With Subtraction
Subtraction with 3-Digit Numbers
Fun With Subtraction
Problem Solving With Subtraction

Language Foundation

1. Interpreting the word **from** in subtraction problems can be confusing for students. We read English from left to right. For problems calling for addition, this will generally work. (How much is five plus two?) However, subtraction problems can require right-to-left processing (five from ten) or left-to-right processing (ten take away five).

Help students interpret the word **from** in the following examples by leading them to write the algorithm that states the problem.

How much is six **from** eight? $(8 - 6)$

Take away three **from** five. $(5 - 3)$

Subtract two **from** ten. $(10 - 2)$

2. **Reduce** means to make smaller. Ask for or give students examples of things that can be reduced, like prices and taxes. When these amounts are reduced, there is a decrease in the original amount. They have learned that decrease means to **subtract**. Therefore, they can now relate reduce to decrease and subtract.

Another example of **reduce** could be to lose weight, perhaps through dieting and exercise. There is a decrease in size and/or weight.

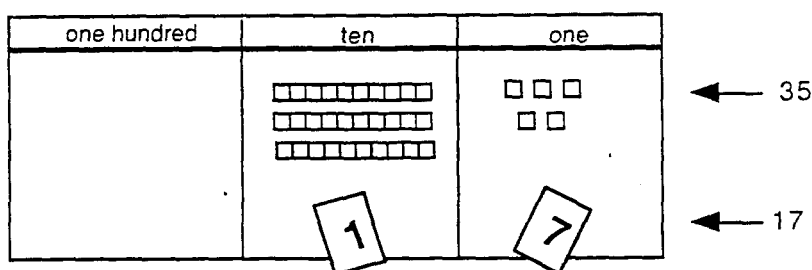
3. Help students to recognize subtraction words in context. Have students write the algorithm for each subtraction problem. (Underline the bolded words).
- You have **nine** apples. You eat **three**. How many **remain** if you eat three? $(9 - 3)$
- **Reduce** the number **three** **by** one. $(3 - 1)$
- There are five dogs in the yard. Two run away. How many are **left**? $(5 - 2)$

(Reduce is a verb which tells students what to do; by is the preposition which tells students how many/how much to subtract.)

4. Students need lots of practice using subtraction terms to interpret problems. Use the activity sheet, Subtraction in Words, as a reinforcement. There is more than one correct way that some of the problems can be written.

Mathematics Component

- Place The Soccer Game transparency on the overhead and read the problem aloud.
 - Then say, "We can use subtraction to find out how many oranges are left in the cooler."
 - Explain that you will use base ten blocks to model the problem. Have one student come up and represent 35 near the top of the overhead Place Value Board. Describe the number 35 as 3 tens and 5 ones.
 - Lead students to verbalize that the number 35 represents the number of oranges in the cooler at the beginning of the soccer tournament.
 - Ask students how many total oranges were eaten by the players during break? (17)
 - Place two small pieces of transparency with the numbers 1 and 7 on them, forming the number 17, at the bottom of the board as shown below.



- Lead students to verbalize that 17 represents the total number of oranges eaten by the players during break.
- Say, "We can subtract 17 **from** 35 to find the number of oranges left in the cooler."
- Record the subtraction problem vertically and horizontally beside the Place Value Board.

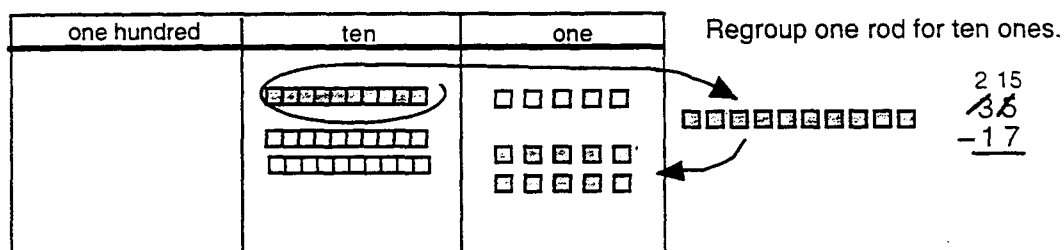
$$\begin{array}{r} 35 \\ -17 \\ \hline \end{array}$$

$$35 - 17 =$$

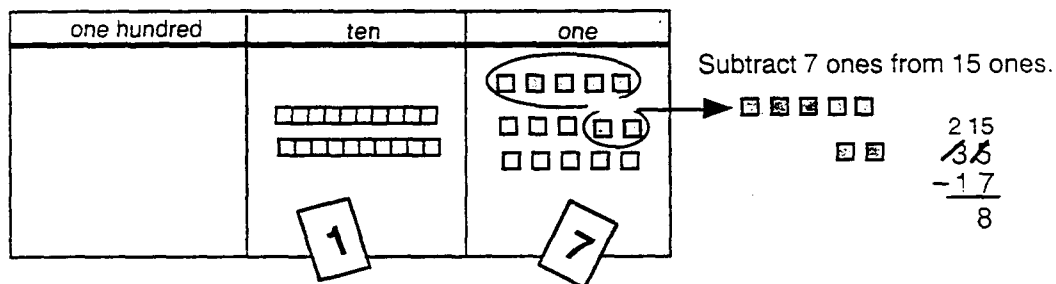
- Tell students that these problems mean that you begin with 35 and subtract or take away 17. Be sure students understand that there are two ways of representing the same problem!
- Remind students that there are also different ways to read a subtraction problem. (See Language Foundation.) Discuss different ways to read this problem:
 - thirty- five minus 17
 - thirty- five take away seventeen
 - seventeen from 35
 - take seventeen away from 35
 - subtract 17 from 35

(Note: Be sure to point out that these are all different ways to read the same problem! There are 35 oranges and we are subtracting 17 in each problem.)

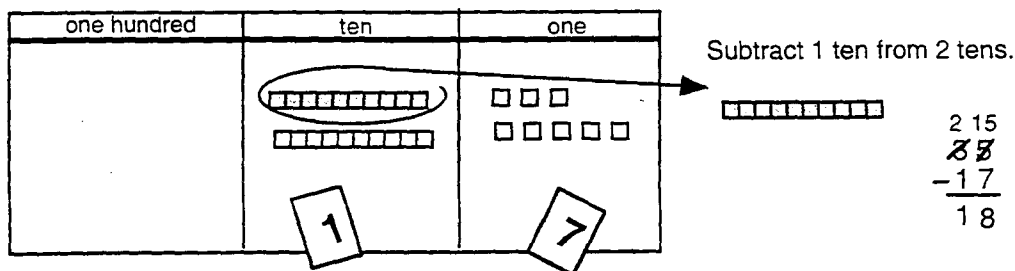
- Ask students if there are enough oranges to eat or **subtract 17**. (Yes, there are more than enough.)
- Tell students that you will use the base ten blocks to show the subtraction.
- Point to the Place Value Board and say, "We have 35 and want to subtract 17. Let's look first at the ones. How many ones do we have?" (5)
- Point to the 7 card and say, "How many ones do we want to subtract or take away?" (7)
- Ask a student to come up to the overhead and subtract 7 ones from the Place Value Board. Lead the class to understand that there are not enough ones to complete the subtraction.
- Allow time for students to suggest a way to show the subtraction. Lead them to understand that a rod (10) can be regrouped into 10 ones.
- Have one student come up to the overhead and model as they describe the regrouping of one rod for ten ones.



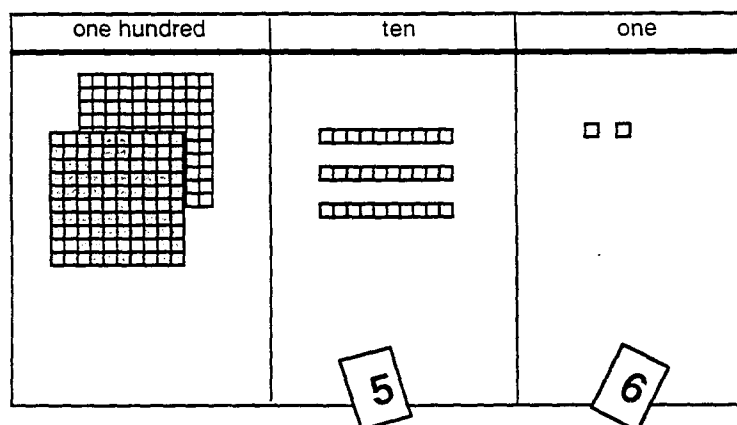
- Say, "We regrouped one rod for 10 ones. How many total blocks do we have now?" (35) Count all of the blocks and lead students to understand that regrouping does not change the total number of blocks.
- Have students orally explain why we regrouped. (Because we only had 5 ones and could not subtract 7 ones.)
- Point to the ones and ask students how many we have now. (15) Say, "Can we subtract or take away 7 now?" (Yes)
- Subtract 7 ones. Say, "7 ones subtracted from 15 ones is 8 ones." Record the difference.



- Now point to the tens and say, "We had three tens before we regrouped, but now we have two tens." Point to the card showing the number of tens to be subtracted and explain that we will subtract one ten."
- Remove one ten and ask how many tens are left. (1) Show that one would be recorded as the answer in the tens column.

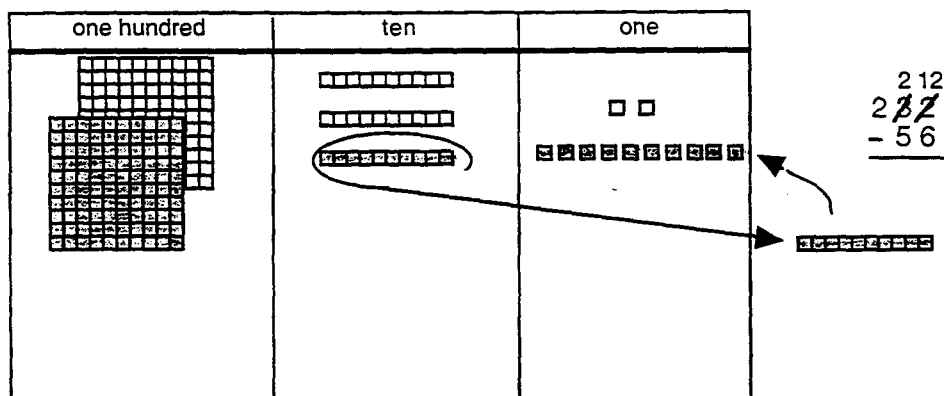


- After working the problem with base ten blocks, reread The Soccer Tournament problem and ask students how many oranges would be left in the cooler. (18)
 - Say, "The difference between 35 and 17 is 18. Verify that the answer is 18 by pointing and counting the blocks on the board, starting with the rods and then moving to the ones. "Ten... eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen. **Eighteen.**"
2. Use the following problem to expand the process to three-digit numbers. Have students work with partners to show the process on Place Value Boards as you model on the overhead.
- Ask students to represent 232 near the top of their boards.
 - Place cards representing 56 near the bottom of the transparent Place Value Board.

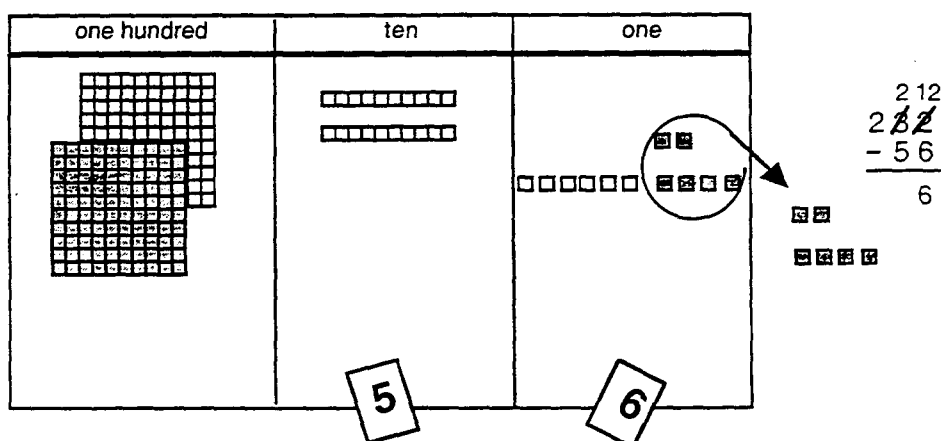


- Tell students that you want to **subtract** 56 from 232. Point to the board as you say, "Two hundred thirty-two minus fifty-six."
- Model and have students discuss and write each step as the blocks are regrouped and subtracted.

- 1) Begin with the ones. Remind students that we have 2 ones and want to subtract 6 ones. Lead students to understand that we must regroup one rod for ten ones in order to subtract. There are now 12 ones and 2 tens. Record these numbers.

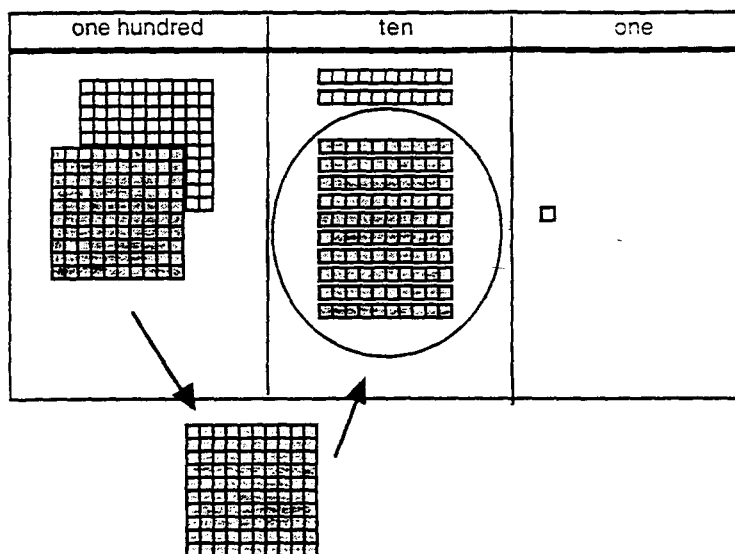


- 2) Subtract the ones and record the number left.

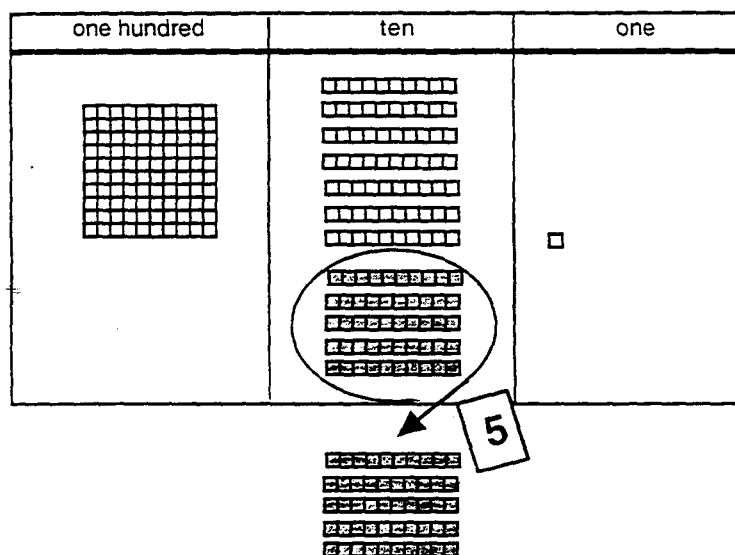


- Ask students if we have subtracted a total of 56. (No, we have only subtracted 6 ones. We have not subtracted the tens or hundreds)
- Review that there are now 2 tens and we want to subtract 5 tens. Help students understand that we need to regroup one flat (100) for ten rods (100) in order to subtract.

- 3) We have 2 tens and want to subtract 5 tens. We must regroup one flat for ten rods. Record the number of hundreds and tens after regrouping.



- 4) Subtract the tens and record the number left.



- Review the amount you started with. (232) Remind students that you have subtracted first 6 ones and then 5 tens (56). Point to the 76 recorded in the problem and say, "Is 232 minus 56 equal to 76? Why?" (No, because there is still 100 left on the board which has not been recorded.") Help students understand that even though there are no hundreds being subtracted, we still need to record the total amount left after subtracting 56, including the hundreds.

- Have a student name the total amount remaining on the board and record as shown. Say, "Two hundred thirty-two minus fifty-six equals one hundred seventy-six."

$$\begin{array}{r} 11212 \\ \cancel{232} \\ - 56 \\ \hline 176 \end{array}$$

- Ask for volunteers to read the problem in other ways. (Example: Fifty-six from two hundred thirty-two is one hundred seventy-six. See the language foundation for other examples.)
- Have students work in pairs, using base ten blocks, to model and record the following subtraction problems. When finished, check answers by having different students model the correct solutions on the overhead.

$$\begin{array}{r} 61 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 51 \\ - 34 \\ \hline \end{array}$$

$$\begin{array}{r} 235 \\ - 149 \\ \hline \end{array}$$

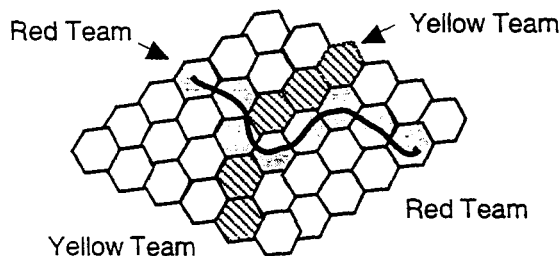
$$\begin{array}{r} 254 \\ - 79 \\ \hline \end{array}$$

$$\begin{array}{r} 198 \\ -162 \\ \hline \end{array}$$

Extension Activity

The following whole class activity provides additional practice with subtraction using regrouping. It may also be used to strengthen estimation skills. Place the transparency Make a Path on the overhead. Divide the class into two teams and assign each team a color. (Use red, blue, green, or other colors available in transparent markers.) Record the team colors on the transparency.

- Explain that each team will begin on a different side of the board. They will solve subtraction problems as they try to move across the board to the opposite side. (See example below.)



- The teams will take turns selecting two numbers from the Number Bank. Allow time for teams to discuss their choices before selecting the numbers. They may not use paper/pencil to help choose the two numbers.
- After selecting the numbers, the team members should work together, subtracting on paper to find the difference.
- When they have found the answer, they should look for the answer on the game board. If it is there, they use a colored marker to shade the hexagon the appropriate color to match their team. Teams may cross over each other, sharing the same hexagon if they can repeat the problem. (Not all answers are on the game board. If a team's answer does not appear, the other team takes a turn. Teacher can verify answers with a calculator.)

- The first team to mark an unbroken path connecting their two sides of the game board is the winner.

(Note: As teams play the game, they may begin to develop estimation strategies which help them choose numbers which are needed. Providing time to share strategies will strengthen their estimation skills.)

4. Additional practice doing subtraction with regrouping is provided on the following activity sheets:
Subtraction With 2-Digit Numbers, More Practice With Subtraction, Subtraction With 3-Digit Numbers, Fun With Subtraction, and Problem Solving With Subtraction.

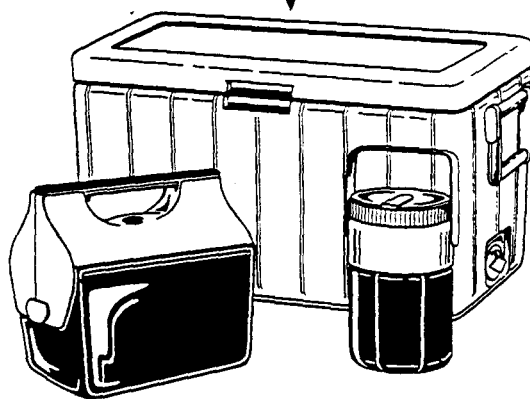
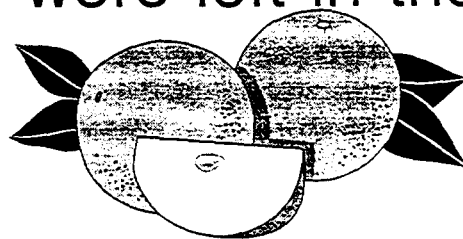


The Soccer Game

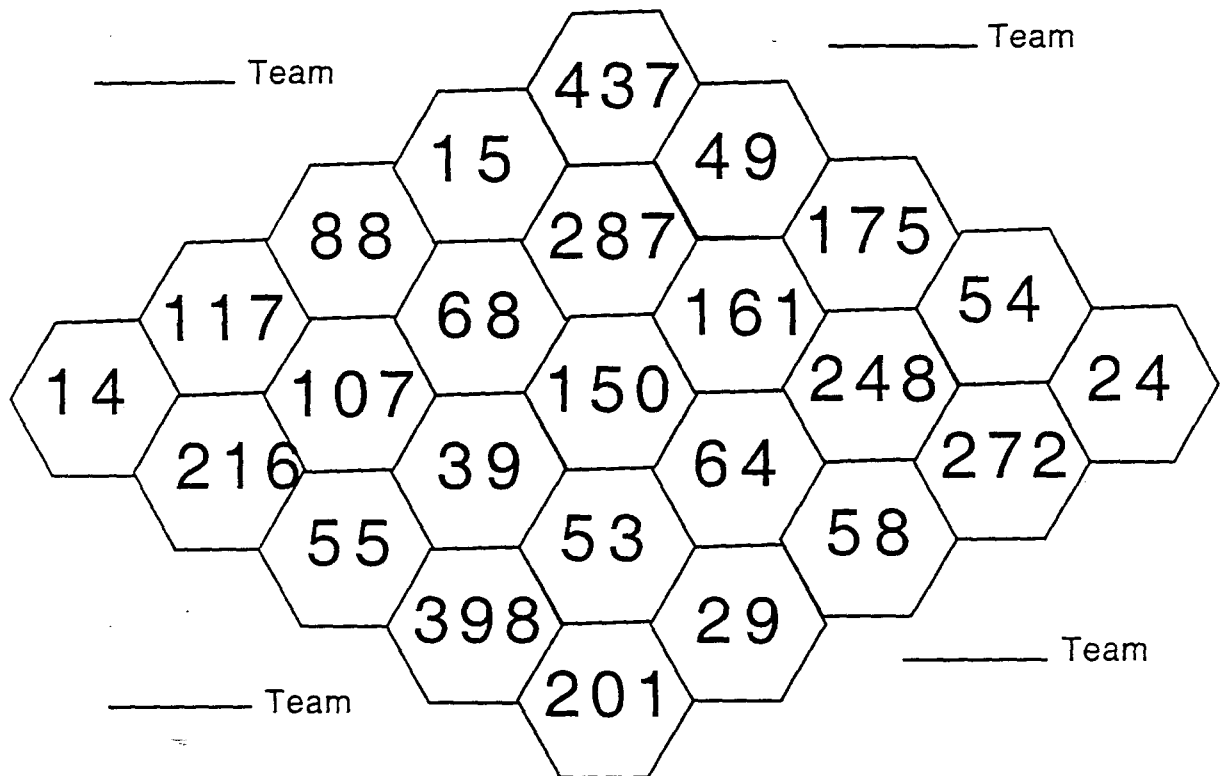
After the soccer game, the players ate oranges. There were 35 oranges in the cooler.



The players ate 17 oranges. How many oranges were left in the cooler?



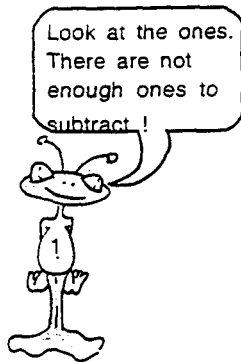
Make A Path



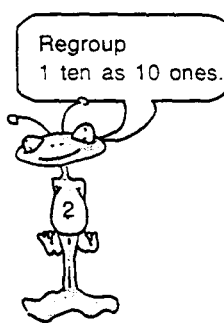
456	19	235	5
122	73	306	34
180	58		

Name: _____

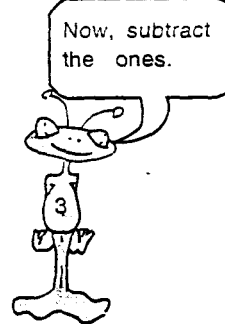
Subtraction with 2-Digit Numbers



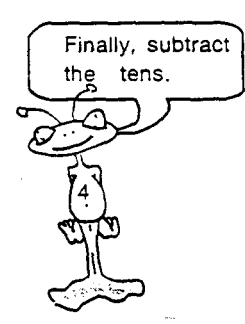
Tens	Ones
6	4
- 2	8
<hr/>	



Tens	Ones
5	14
8	4
- 2	8
<hr/>	



Tens	Ones
5	14
8	4
- 2	8
<hr/>	
	6



Tens	Ones
5	14
8	4
- 2	8
<hr/>	
3	6

Subtract. Use blocks to help.

1)

Tens	Ones
<input type="text"/>	<input type="text"/>
3	3
- 1	5
<hr/>	

2)

Tens	Ones
<input type="text"/>	<input type="text"/>
7	2
- 4	3
<hr/>	

3)

Tens	Ones
<input type="text"/>	<input type="text"/>
8	0
- 6	1
<hr/>	

4)

Tens	Ones
<input type="text"/>	<input type="text"/>
5	7
- 2	9
<hr/>	

5)

Tens	Ones
<input type="text"/>	<input type="text"/>
4	6
- 3	7
<hr/>	

6)

Tens	Ones
<input type="text"/>	<input type="text"/>
9	3
- 6	5
<hr/>	

7)

Tens	Ones
<input type="text"/>	<input type="text"/>
3	1
- 1	4
<hr/>	

8)

Tens	Ones
<input type="text"/>	<input type="text"/>
6	4
- 3	7
<hr/>	

Name: _____

More Practice With Subtraction

Subtract. Regroup when you need to. Use blocks to help.

$$\begin{array}{r} 1) \quad 59 \\ - 36 \\ \hline \end{array}$$

$$\begin{array}{r} 2) \quad 82 \\ - 28 \\ \hline \end{array}$$

$$\begin{array}{r} 3) \quad 30 \\ - 15 \\ \hline \end{array}$$

$$\begin{array}{r} 4) \quad 67 \\ - 29 \\ \hline \end{array}$$

$$\begin{array}{r} 5) \quad 88 \\ - 49 \\ \hline \end{array}$$

$$\begin{array}{r} 6) \quad 24 \\ - 21 \\ \hline \end{array}$$

$$\begin{array}{r} 7) \quad 95 \\ - 37 \\ \hline \end{array}$$

$$\begin{array}{r} 8) \quad 57 \\ - 18 \\ \hline \end{array}$$

$$\begin{array}{r} 9) \quad 70 \\ - 52 \\ \hline \end{array}$$

$$\begin{array}{r} 10) \quad 93 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 11) \quad 31 \\ - 24 \\ \hline \end{array}$$

$$\begin{array}{r} 12) \quad 56 \\ - 13 \\ \hline \end{array}$$

Reading With Subtraction Words Use the words in the box to complete the sentences.

1) When I subtract two numbers, I find the _____.

2) If you want to subtract 8 ones from 4 ones you will need to _____.

3) To see if you need to regroup, first look at the _____.

4) After you regroup 1 ten, you will have _____ ones.

5) You always subtract the tens _____ the ones.

6) The subtraction sign (—) is called a _____ sign.

minus difference
ten
regroup after
ones

Name: _____

Subtraction With 3-Digit Numbers



Remember the steps:

- 1) Look at the ones. (Do you need to regroup?) Subtract the ones.
- 2) Look at the tens. (Do you need to regroup?) Subtract the tens.
- 3) Then, subtract the hundreds.

1)

Hundreds	Tens	Ones
5	17	<input type="text"/>
2	9	8
— 2	9	5
3	8	3

2)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
3	3	5
— 1	2	7

3)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
9	4	6
— 8	5	4

4)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
3	9	1
—	7	2

5)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
4	3	6
— 2	5	1

6)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
8	7	3
—	9	0

7)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
6	5	4
— 1	7	1

8)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
9	2	3
— 5	3	7

9)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
1	5	4
— 1	3	4

10)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
4	9	1
— 2	6	6

11)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
5	5	2
— 3	4	8

12)

Hundreds	Tens	Ones
<input type="text"/>	<input type="text"/>	<input type="text"/>
2	2	9
—	6	5

NAME: _____

FUN WITH SUBTRACTION

Use the numbers below to write your own problems.

Then give your partner the problems to solve.

Check the answers when they have finished.

Be sure to follow the instructions!

2 5 3

1 9 1

3 3 7

6 4 0

8 6 8

7 0

5 3 1

1 1 4

Write three subtraction problems where you do not need to regroup.

1)

- _____

2)

- _____

3)

- _____

Write three subtraction problems where you need to regroup.

4)

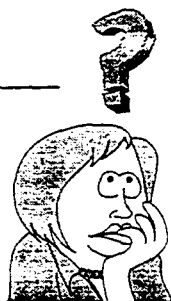
- _____

5)

- _____

6)

- _____

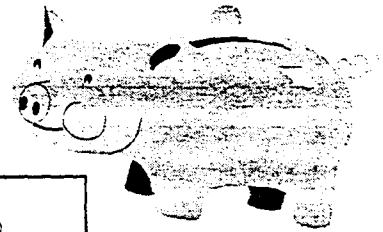








Name: _____

Problem Solving With Subtraction



Number of Pennies Saved



Ken 220 	Ari 115 
Shayna 639 	Carol 842 
José 47 	Vanya 533 

- 1) What is the difference between the number of pennies Ari saved and the number of pennies José saved?
- 2) Who saved the fewest pennies? _____
- 3) Who saved the most pennies? _____
- 4) What is the difference between the most and the fewest pennies?
- 5) Which two kids have a difference of 622 pennies?
- 6) Which two boys have a difference of 68 pennies?
- 7) What is the difference between all the girls' pennies and all the boys' pennies?

Objective 9: Estimate (using rounding) and add 3- and 4-digit numbers with and without regrouping. Check addition by using subtraction.

Vocabulary

estimate
round
rounding
near
nearer
close
closer
closest
halfway
between

Materials

numbered cards 10 - 20 (teacher made)

Transparencies:

Using a Number Line to Round
Rounding to the Nearest Ten
Rounding Problem
Rounding Numbers

Student Copies:

Round to the Nearest Ten
Rounding With Larger Numbers
Estimate, Add, and Check

Language Foundation

1. Draw a circle on the board and explain that the circle is **round**. Write a zero next to the circle indicating the roundness of the zero. Tell students that in this lesson they will learn to round numbers. This means that the end of the number will be zero or round.
2. Review the meaning of **estimate** from previous lessons. Explain that **rounding** is another way of estimating when we are not looking for an exact answer.
3. Review the meaning of the suffixes -er and -est (NCT Obj. 7). Remind the students that an -er ending means we are comparing 2 things. Tell them that when we use the word **nearer**, we are asking which of 2 things is closer to something else. Ask a few questions such as "Is Carlos **nearer** the door or the window?" or "Am I **nearer** the chalkboard or the door?"

Review that **closest** means we are comparing more than 2 things. Ask questions such as "Which student is **closest** to the door?" or "Who is **closest** to the bulletin board?"

Mathematics Component

Estimate Using Rounding

1. Give cards numbered 10 - 20 to individual students.
 - Ask them to line up facing the class in order from 10 to 20.
 - Ask questions such as the following which point out the relationship of the numbers to each other.
 - Is 12 **nearer** to 10 or 20? (10)
 - What number is **closest** to 10? (11)
 - Is 17 **nearer** to 10 or 20? (20)
 - What number is **halfway** (in the middle of) between 10 and 20? (15) To verify that 15 is halfway, count the numbers between 10 and 15 and then between 15 and 20.
 - Collect the cards and have students sit down.
2. Place the Using a Number Line to Round transparency on the overhead, covering the rules at the bottom of the page.
 - Explain that you can use the number line to estimate whether a number is about 60 or about 70.
 - Circle the number 62 on the transparency.
 - Ask students if 62 is nearer to 60 or 70. (60) Show them that they are correct by counting back to 60 (getting two numbers) and then counting ahead to 70 (getting eight numbers).
 - Fill in 60 beside the number 62 on the chart.
 - Repeat for all of the other numbers on the chart.
 - Tell students that we have been **rounding** numbers. Ask if they can see a pattern for rounding. Lead them to develop the following rules:
 - If the ones digit is less than 5, round down.
 - If the ones digit is more than 5, round up.
 - Point to 65 on the number line. Say, "Is 65 closer to 60 or 70?" (It is in the middle.)
 - Discuss whether 65 should be rounded to 60 or to 70. Lead students to understand that:
 - If the ones digit is a 5, round up.
 - Uncover the rules at the bottom of the page and read them together.
 - Place the Rounding to the Nearest Ten transparency on the overhead.
 - For each number, have students identify the nearest tens that come before and after the number and then use the rules to round up or down. (If students need help identifying the ten that comes before and after each number, use a large wall-mounted number line as a reference.)
 - When students are comfortable with this concept, give each student a copy of the activity sheet Round to the Nearest Ten.

3. Quickly review the rules for rounding.
- Tell students that we are now going to round to the nearest hundred.
 - Place the Rounding Problem transparency on the overhead.
 - Read the problem at the top of the page aloud.
 - Look at the items listed on the chart. Have students identify the hundreds that come before and after each number and then have them tell which hundred is nearest.
 - When finished, ask students if they see a pattern for rounding to the nearest hundred. Lead them to develop the following rules and record them at the bottom of the page.
 - Look at the tens digit to decide whether to round up or down.
 - If the tens digit is less than 5, round down.
 - If the tens digit is more than 5, round up.
 - If the tens digit is 5, round up.
 - Place the transparency Rounding to the Nearest Ten (used earlier) back on the overhead.
 - Ask students how many zeros are in 10. (1) Show that rounding a number to the nearest 10 means it ends in 1 zero, just like 10.
 - Place the Rounding Problem transparency (used earlier) back on the overhead.
 - Ask students what they notice about 0 when you round a number to the nearest 100. (It ends in 2 zeros, just like 100.)
 - Have students complete the first two sections of the activity sheet Rounding With Larger Numbers independently or with a partner. Check answers together as you discuss the rounding procedure.
4. Tell students that we can use place value to round any number. Extend the rules and procedures discussed above to rounding numbers to the nearest thousand.
- Write the following numbers on the board or on a transparency:
 - 2, 375
 - 5, 680
 - 1, 058
 - 9,852
 - Have students orally identify the thousand that comes before and after each number as shown below.
 - 2,375 is between two thousand and three thousand.
 - 5,680 is between five thousand and six thousand.
 - 1,058 is between one thousand and two thousand.
 - 9,852 is between nine thousand and ten thousand.
 - Ask if anyone can guess how many zeros each of these numbers will end in if we round them to the nearest thousand. (They will each end in 3 zeros, just like 1,000.)

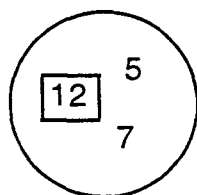
- Lead students to understand that in order to round to the nearest thousand, they will need to look at the hundreds digit and follow the rounding rules previously established.
 - If the 100s digit is less than 5, round down.
 - If the 100s digit is more than 5, round up.
 - If the 100s digit is 5, round up.
 - Have students use these rules to round each number on the board to the nearest thousand.

Number	Rounds to
2,375	2,000
5,680	6,000
1,058	1,000
9,852	10,000
 - Additional student practice on rounding to the nearest thousand can be found in the last exercise on the activity sheet Rounding With Larger Numbers.
5. Work with students to continue the rounding process with larger numbers.
- Write 26,875 on the board. Have a student read the number aloud.
 - Tell students that you want to round the number to the nearest ten thousand. Underline the ten thousand digit in the number. (26,875)
 - Give students a few minutes to talk with a partner about how they would round the number and ask them to write their answer on a piece of paper.
 - Ask one group to tell how many zeros their answer ends in. (It should end in 4 zeros, just like 10,000.)
 - Ask another group what number they looked at to round the number to the nearest ten thousand. (They needed to look at the one thousand digit.)
 - Have one student identify the one thousand digit. (6)
 - Have one group read their answer. (Lead students to understand that 26,875 rounded to the nearest ten thousand would be 30,000.)
 - Use the transparency/wall poster Rounding Numbers to review the steps the class took to round the number.
 - Locate and underline the digit you will round to.
 - Look at the digit to the right.
 - If that digit is less than 5, round down.
 - If that digit is more than 5, round up.
 - If that digit is 5, round up.
 - Help students understand that these rules may be used to round a number to any place value. Tell them that rounding is another way to **estimate** an answer. Remind students that estimating means that we are finding an answer that is close, but not an exact answer.

Using Subtraction to Check Addition

6. Briefly review the following reasons why we might estimate an answer in math.

- One reason is to help us make decisions. For example, will the \$5.00 we have be enough to buy the three items we want.
- A second reason is to check the reasonableness of an answer . If we correctly estimate an answer to be 200 and the exact answer is 986, then the answer is not reasonable because it is not close to 200. We would need to go back and check our work.
- Tell students that there is a way to check our exact answer if we are adding.
- Draw the following number family on the board or on a transparency. Remind students that 12 is the **whole** and 5 and 7 are the **parts**. Have students come up and write number sentences using the numbers in this family.



$$\begin{aligned}7 + 5 &= 12 \\5 + 7 &= 12 \\12 - 5 &= 7 \\12 - 7 &= 5\end{aligned}$$

- Remind students that addition and subtraction are opposite. We can start with the **parts** and add to get the **whole** or we can start with the whole and **subtract** to get the parts.
- Write the following problem on the board.

$$\begin{array}{r}8 \\+7 \\ \hline 15\end{array}$$

- Ask students to name the whole and the parts. (The whole is 15 and the parts are 7 and 8.)
- Tell students that if this problem is added correctly, then we should be able to use the numbers 8, 7, and 15 to write subtraction sentences that are correct.
- Have students name the two subtraction sentences. ($15 - 7 = 8$ and $15 - 8 = 7$)
- Explain that checking to see if the subtraction sentences are correct is one way to check the answer to the addition problem.
- Use manipulatives to verify that $15 - 7 = 8$ and $15 - 8 = 7$. Say, "The subtraction sentences are correct so we know that $8 + 7 = 15$ is correct. We have used subtraction to check our addition."
- Explain that even though there are two subtraction sentences for this problem, checking addition with one subtraction problem is enough. We can use $15 - 7 = 8$ or $15 - 8 = 7$ to check the addition.

- Write the following problems on the board.

$$\begin{array}{r} 13 \\ + 5 \\ \hline 18 \end{array} \qquad 12 + 6 = 18$$

- Ask students to turn to a partner. Have one student in each group tell a subtraction sentence that could be used to check the first addition problem. Share responses. ($18 - 5 = 13$ or $18 - 13 = 5$) Then ask the other student in each group do the same with the second problem. Share responses ($18 - 6 = 12$ or $18 - 12 = 6$).
- To practice a combination of skills - estimating by rounding, adding 3- and 4-digit numbers, and checking addition with subtraction, have students complete the activity sheet Estimate, Add, and Check.

Using a Number Line to Round



Number Rounds to	
62	→
68	→
61	→
69	→
70	→

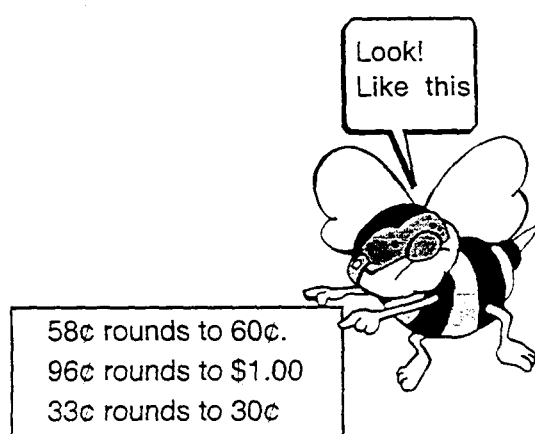
Number Rounds to	
67	→
63	→
65	→
64	→
66	→

Rounding Rules

- * If the ones digit is less than 5, round down .
- * If the ones digit is more than 5, round up .
- * If the ones digit is 5, round up .

Rounding to the Nearest Ten

<u>Number to Round</u>	<u>Nearest Tens</u>		<u>Rounded To</u>
34	_____	_____	_____
89	_____	_____	_____
25	_____	_____	_____
97	_____	_____	_____
11	_____	_____	_____
73	_____	_____	_____



Try these:

1) 16¢ _____

2) 84¢ _____

3) 98¢ _____

4) 25¢ _____

Name: _____

Round to the Nearest Ten








Round each number to the nearest ten.
Write the ten that comes before and after the number.

<u>Number to Round</u>	<u>Nearest Tens</u>		<u>Rounded To</u>
43	<u>40</u>	<u>50</u>	<u>40</u>
1) 77	—	—	—
2) 88¢	—	—	—
3) 31	—	—	—
4) 17	—	—	—
5) 95	—	—	—
6) 29	—	—	—
7) 13¢	—	—	—
8) 46	—	—	—
9) 67	—	—	—
10) 52	—	—	—

<u>Number to Round</u>	<u>Before and After</u>		<u>Rounded To</u>
11) 32	—	—	—
12) 63	—	—	—
13) 49¢	—	—	—
14) 22	—	—	—
15) 81	—	—	—
16) 36	—	—	—
17) 44	—	—	—
18) 78¢	—	—	—
19) 61	—	—	—
20) 15	—	—	—

Rounding Problem

My family went to visit many famous cities this summer. About how many hundred miles did we drive to each city from our hotel?

City	Number of Miles	Nearest Hundreds	Rounded Miles
 San Antonio	108	___	___
 Philadelphia	465	___	___
 Washington, D.C.	657	___	___
 San Francisco	223	___	___
 New York	531	___	___

Rules for Rounding to the Nearest Hundred

Name: _____

Rounding With Larger Numbers



Round to the nearest hundred. (Remember to write the two nearest hundreds).

- | | |
|---|-------------------------|
| 1) 231 (<u>200</u> <u>300</u>) <u>200</u> | 6) 403 (_____) _____ |
| 2) 349 (_____) _____ | 7) 347 (_____) _____ |
| 3) 898 (_____) _____ | 8) 654 (_____) _____ |
| 4) 362 (_____) _____ | 9) 199 (_____) _____ |
| 5) 485 (_____) _____ | 10) 550 (_____) _____ |


Try rounding some money. Round to the nearest dollar.

- | | |
|---------------------------|----------------------------|
| 1) \$2.89 (_____) _____ | 3) \$ 7.57 (_____) _____ |
| 2) \$5.23 (_____) _____ | 4) \$4. 14 (_____) _____ |

Round to the nearest thousand. (Remember to write the two nearest thousands).

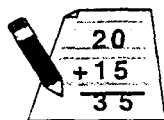
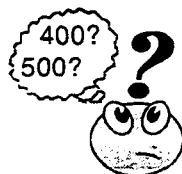
- | | |
|--|---------------------------|
| 1) 2,426 (<u>2000</u> <u>3000</u>) <u>2000</u> | 6) 3,162 (_____) _____ |
| 2) 8,568 (_____) _____ | 7) 9,030 (_____) _____ |
| 3) 2,302 (_____) _____ | 8) 7,445 (_____) _____ |
| 4) 4,988 (_____) _____ | 9) 1,991 (_____) _____ |
| 5) 5,675 (_____) _____ | 10) 6,310 (_____) _____ |

ROUNDING NUMBERS

- LOCATE AND UNDERLINE THE DIGIT YOU WILL ROUND TO. $4,\underline{6}80$
- LOOK AT THE DIGIT TO THE RIGHT. $4,\underline{6}\overset{\curvearrowright}{8}0$
- IF THAT DIGIT IS LESS THAN 5, ROUND DOWN.
- IF THAT DIGIT IS MORE THAN 5, ROUND UP.
 $4,\underline{6}\boxed{8}0 = 4,700$

- IF THAT DIGIT IS 5, ROUND UP.

Name _____

Estimate, Add, and Check



1) Estimate the sum by rounding.

$$\begin{array}{r} 382 \rightarrow 400 \\ + 217 \rightarrow +200 \\ \hline 600 \end{array}$$

2) Add to find the exact answer.

$$\begin{array}{r} 382 \\ + 217 \\ \hline 599 \end{array}$$

3) Check addition by subtracting.

$$\begin{array}{r} 599 \\ - 217 \\ \hline 382 \end{array}$$

1)

$$\begin{array}{r} 594 \rightarrow \text{-----} \\ + 105 \rightarrow + \text{-----} \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} 594 \\ + 105 \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} \text{-----} \\ - \text{-----} \\ \hline \text{-----} \end{array}$$

2)

$$\begin{array}{r} 776 \rightarrow \text{-----} \\ + 156 \rightarrow + \text{-----} \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} 776 \\ + 156 \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} \text{-----} \\ - \text{-----} \\ \hline \text{-----} \end{array}$$

3)

$$\begin{array}{r} 2,304 \rightarrow \text{-----} \\ + 6,586 \rightarrow + \text{-----} \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} 2,304 \\ + 6,586 \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} \text{-----} \\ - \text{-----} \\ \hline \text{-----} \end{array}$$

4)

$$\begin{array}{r} 3,375 \rightarrow \text{-----} \\ + 5,808 \rightarrow + \text{-----} \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} 3,375 \\ + 5,808 \\ \hline \text{-----} \end{array}$$

$$\begin{array}{r} \text{-----} \\ - \text{-----} \\ \hline \text{-----} \end{array}$$

Objective 10: Model and use symbolic notation with 3- and 4-digit numbers to subtract across zeros.

Vocabulary

about how much
difference
subtract
from
regroup

Language Foundation

1. Provide as many opportunities as possible to build upon previously taught vocabulary, allowing students to verbalize their thinking. Modeling aloud is also good reinforcement.

Materials

base ten blocks
place value boards

Transparencies:

Place Value Board
Basketball Tickets
A School Musical
Math Alert! Tricky Regrouping

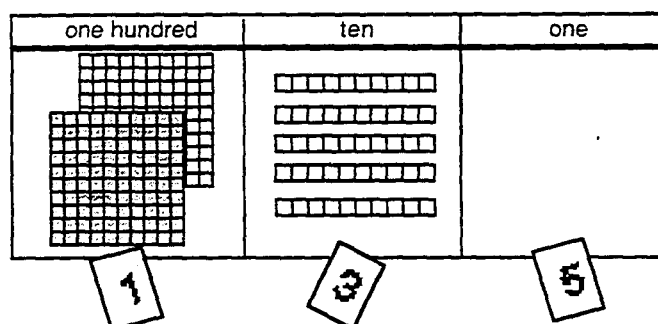
Student Copies:

Place Value Boards
Basketball Tickets
Subtracting Across Zeros

Mathematics Component

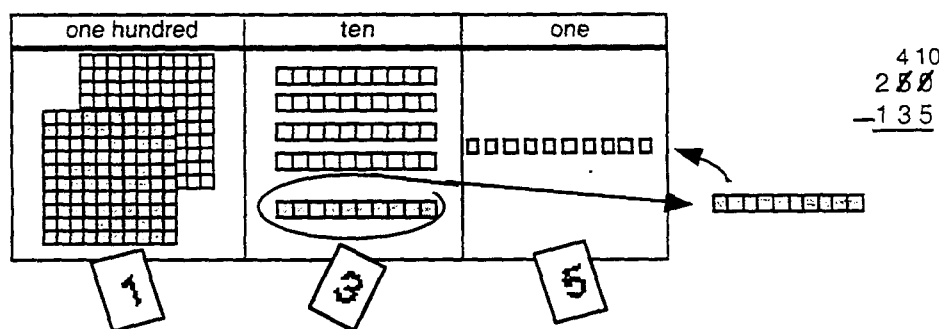
Note: In this lesson, students will extend their understanding of subtraction to include regrouping across zeros. Skills taught in previous objectives, such as estimation and checking subtraction with addition should continue to be encouraged.

1. Distribute Place Value Boards (TR) and base ten blocks to each pair of students. (Be sure each bag of blocks includes at least 3 hundreds, 10 tens, and 15 ones.) Place an overhead Place Value Board on the overhead.
 - Have students represent 250 on their boards as you model on the overhead.
 - Explain that you want to subtract 135 from 250. Ask students *about* how much they think it will be and encourage them to explain their thinking. Place transparent cards representing 135 at the bottom of the board as shown. Record the problem on the side.



$$\begin{array}{r} 250 \\ -135 \\ \hline \end{array}$$

- Ask students if they will need to regroup to subtract these numbers. (Yes)
- Model regrouping 1 rod for 10 ones on the overhead and have students do the same. Be sure to point out that 2 hundreds, 5 tens and 0 ones have the *same total value* as 2 hundreds, 4 tens, and 10 ones. Record the regrouping symbolically beside the problem.



$$\begin{array}{r} 410 \\ 2\cancel{5}\cancel{0} \\ -135 \\ \hline \end{array}$$

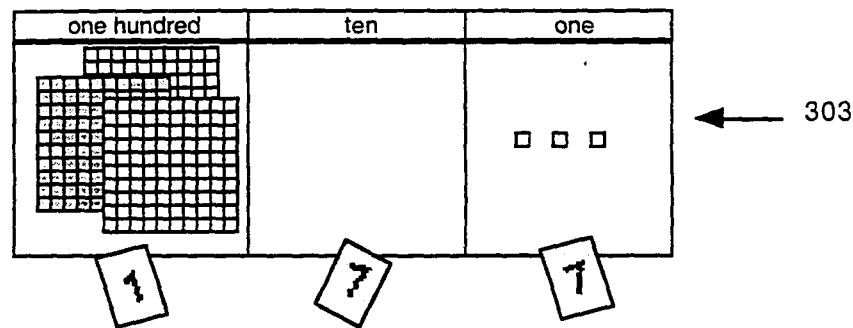
- Have students subtract 135 blocks. Say, "How many blocks are left? What is the **difference** between 250 and 135?" (115) Record the difference on the problem.
- Ask, "How can we check to be sure that 115 is the exact answer?" (Add 135 and 115 to see if it equals 250.)
- Have one student come up and model adding to check the subtraction.

$$\begin{array}{r} 135 \\ +115 \\ \hline 250 \end{array}$$

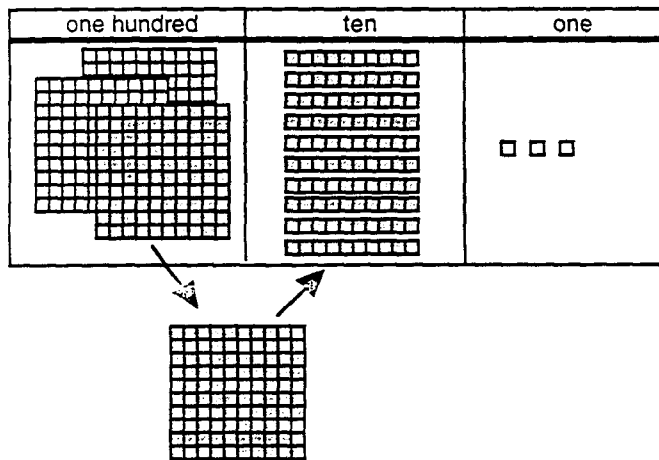
2. Tell students that now you will use base ten blocks to model and solve a problem.
 - Distribute individual copies of the activity sheet Basketball Tickets.
 - Place a transparency copy of the activity sheet on the overhead and read aloud.
 - Ask, "How many total tickets were on sale for the basketball game?" (303) "How many tickets did they sell on Monday?" (177)
 - Encourage students to use and discuss estimation strategies to predict *about* how many tickets were left. (For example, rounding to the nearest hundred (300 - 200) would give an estimate of about 100. Using lead digit (303 - 177) would result in an estimate of about 200.
 - Have students suggest a way to find the exact answer. (Subtract 177 from 303.)
 - Read Step 1 aloud and model writing the problem. Have students do the same.

$$\begin{array}{r} 303 \\ - 177 \\ \hline \end{array}$$

- Ask each pair of students to use their base ten blocks to represent 303 on their Place Value Board (TR). Have one student come up and model on the overhead.



- Remind students that we want to subtract 177 from 303.
- Point out that there are not enough ones to subtract; however, there are no tens to regroup. Lead students to understand that they must go over and regroup the hundreds first.
- Model regrouping a hundred for ten tens and have students do the same.

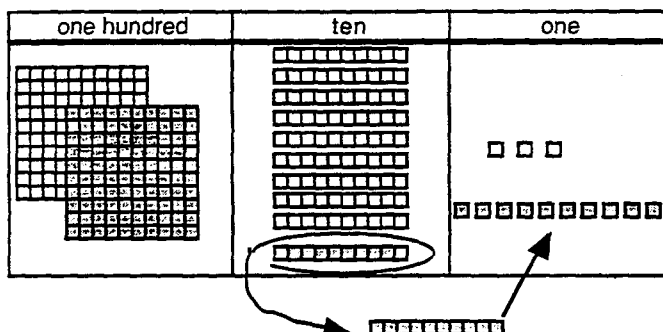


Note: Verify that the total amount has not changed. There is still 303 on the board after regrouping!

- Read Step 2 aloud and model recording the regrouping. Have students do the same.

$$\begin{array}{r} 210 \\ \cancel{30}3 \\ - 177 \\ \hline \end{array}$$

- Look back at the Place Value Board transparency and ask students if we can now subtract the ones? Why? (No, because we have only regrouped 1 hundred for 10 tens. We still do not have enough ones to subtract.)
- Say, "What can we do to subtract the ones?" (Regroup a ten for 10 ones.) Have a student model the regrouping.

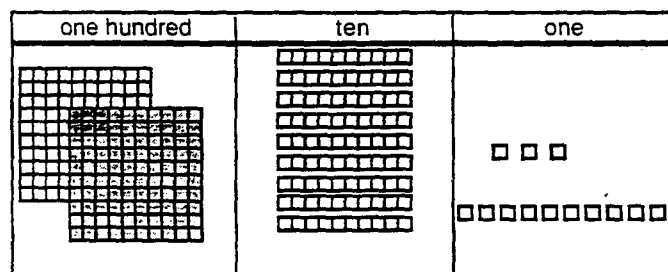


Note: Verify that the total amount has not changed. There is still 303 on the board after regrouping!

- Read Step 3 aloud and model recording the regrouping as shown. Have students do the same.

$$\begin{array}{r} 9 \\ 2\cancel{1}013 \\ \cancel{30}3 \\ - 177 \\ \hline \end{array}$$

- Ask, "How many hundreds do we have now?" (2) "Tens?" (9) "Ones?" (13) What is the total value? (303)



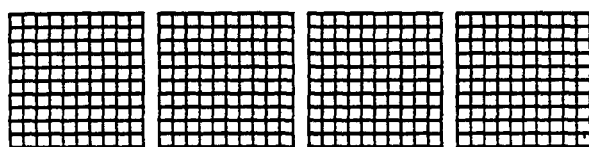
- Ask students if we can subtract 177? (Yes) Model removing the appropriate blocks and have students do the same.
- Have a student tell what is left on the board. (126)
- Read Step 4 aloud and model recording the difference as shown.

$$\begin{array}{r} 9 \\ 2\cancel{1}013 \\ \cancel{30}3 \\ - 177 \\ \hline 126 \end{array}$$

3. Tell students they will now work with a partner to solve a problem using base ten blocks. Make sure each pair has a bag of base ten blocks which includes at least 4 hundreds, 10 tens, and 18 ones. Explain that after they work with their partner, some groups will come up and show how to solve the problem.

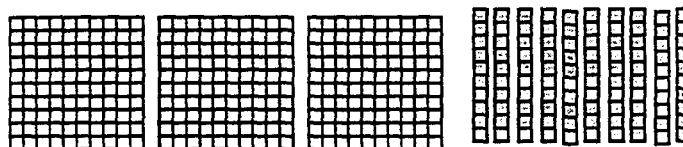
- Place the A School Musical transparency on the overhead and read the problem aloud.
- Tell the students that they may not use paper or pencil to solve the problem! They may **only** use the place value blocks on their desk.
- After students have had time to work together, ask if any group would like to come up to the overhead and explain how they solved the problem. Have a few groups give their solution and model how they got that answer.
- Write the problem on the board and record symbolically as you review the correct procedure again:

Step 1 - Represent the number of seats in the gym using base ten blocks.



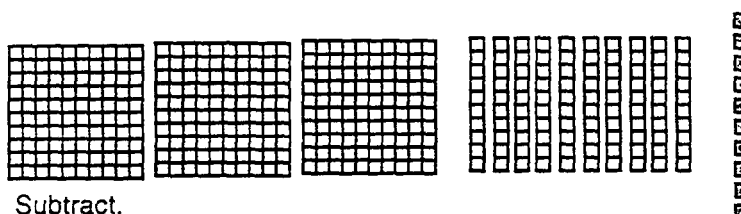
$$\begin{array}{r} 400 \\ -179 \\ \hline \end{array}$$

Step 2 - Regroup 1 hundred for 10 tens.



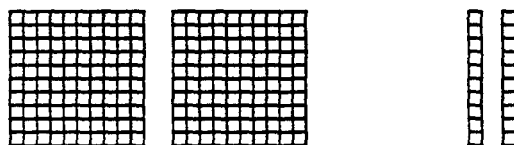
$$\begin{array}{r} 310 \\ \cancel{4}00 \\ -179 \\ \hline \end{array}$$

Step 3 - Regroup 1 ten for 10 ones.



$$\begin{array}{r} 9 \\ 31\cancel{0}0 \\ \cancel{4}00 \\ -179 \\ \hline \end{array}$$

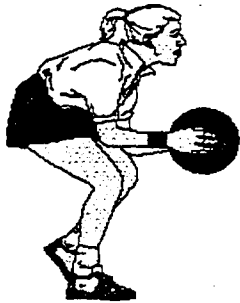
Step 4 - Subtract.



$$\begin{array}{r} 9 \\ 31\cancel{0}0 \\ \cancel{4}00 \\ -179 \\ \hline 221 \end{array}$$

- Have students check the answer using addition.
- A wall poster/transparency review Math Alert! Tricky Regrouping is provided for review/reinforcement of this concept. Additional practice subtracting across zeros is also provided on the following activity sheets: Subtracting Across Zeros.

Name: _____



Basketball Tickets



There were 303 tickets on sale for the big game this week at the high school. On Monday, students sold 177 of the tickets.

How many tickets were left to sell?

Step 1: Write the problem.

Step 2: Regroup the hundreds.

Step 3: Regroup the tens.

Step 4: Subtract



A School Musical

There is a musical show at school today. The show is in the gym. There are 400 seats . 179 students are already sitting down . How many more students can attend the show?



Math Alert! Tricky Regrouping



Here's the problem:
Subtract: $7,004 - 1,658$

This will help
you understand
regrouping.



$1,000 = 10$ hundreds

10 hundreds $= 9$ hundreds $+ 10$ tens

9 hundreds $+ 10$ tens $= 9$ hundreds $+ 9$ tens $+ 10$ one

Thousands	Hundreds	Tens	Ones
6	9	9	14
7	0	0	4
<hr/>			
1	6	5	8

- Try to subtract the ones. OOPS! You need more ones.
- There are no tens or hundreds, so regroup one of the thousands. Now you have 6 thousands and 10 hundreds.
- Regroup one of the hundreds.
Now you have 9 hundreds and 10 tens.
- Regroup the tens. Now you have 9 tens and 14 ones.
- NOW you can subtract the ones!!

6	9	9	14
7	0	0	4
<hr/>			
1	6	5	8
<hr/>			
5	3	4	6



Name: _____

Subtracting Across Zeros

Subtract. 30 - 6

$$\begin{array}{r} 4 \overline{) 30} \\ - 6 \\ \hline \end{array}$$

6 > 0
Regroup 5 tens
as 4 tens 10 ones.

Subtract. 40 - 10

$$\begin{array}{r} 40 \\ - 10 \\ \hline \end{array}$$

0 = 0
No regrouping
needed.

Subtract. 57 - 20

$$\begin{array}{r} 57 \\ - 20 \\ \hline \end{array}$$

0 < 7
No regrouping
needed.

Check if you need to regroup or not. Then subtract.

1) $\begin{array}{r} 80 \\ - 56 \\ \hline \end{array}$ Regroup? ☐ Yes ☐ No

2) $\begin{array}{r} 90 \\ - 30 \\ \hline \end{array}$ Regroup? ☐ Yes ☐ No

3) $\begin{array}{r} 78 \\ - 34 \\ \hline \end{array}$ Regroup? ☐ Yes ☐ No

4) $\begin{array}{r} 20 \\ - 3 \\ \hline \end{array}$ Regroup? ☐ Yes ☐ No

5) $\begin{array}{r} 59 \\ - 40 \\ \hline \end{array}$ Regroup? ☐ Yes ☐ No

6) $\begin{array}{r} 40 \\ - 27 \\ \hline \end{array}$ Regroup? ☐ Yes ☐ No



Practice regrouping to subtract with zeros across all place values:

Hundreds	Tens	Ones
4	9	10
5	0	0

Hundreds	Tens	Ones
8	0	0

Hundreds	Tens	Ones
4	0	0

Hundreds	Tens	Ones
1	0	0

Hundreds	Tens	Ones
9	0	3

Hundreds	Tens	Ones
6	0	5

Objective 11: Estimate (using a variety of strategies), add, and subtract any whole numbers and demonstrate strategies.

Vocabulary

estimation
mental math
computation

Materials

Transparencies:

Slide into Perfect Math Scores!
Estimation and Computation Review

Student Copies:

Let's Practice

Language Foundation

1. Remind students of the difference between **estimation** and **mental math** from Objective 3.
 - Estimation does not require an exact answer.
 - In mental math, students will use strategies to find an exact answer. **Computation** may be used to find exact answers, also.

Mathematics Component

Note: This lesson combines review of estimation strategies with additional practice of addition and subtraction computation skills. As students continue to explore estimation strategies throughout the operation unit, they will begin to recognize when an estimate is appropriate and understand its benefit in determining if computation answers are reasonable.

1. Place the Slide into Perfect Math Scores! transparency on the overhead.
 - Talk briefly about baseball games. Ask who has played baseball or been to a baseball game.
 - If students are unfamiliar with the game, point to the transparency as you explain that the game is played on a field which is in the shape of a diamond. Tell students that in this game there is a pitcher and a batter. Show where they stand. Explain that the pitcher throws the ball to the batter. The batter tries to hit the ball and run around all three bases so that he/she can get back to the beginning and score a point.
 - Tell students that doing addition, subtraction, multiplication, and division is a little bit like a baseball game. When students get a problem, there are three things they can do that will help them get a correct answer.
 - Point to first base and explain that the first thing they can do is mentally estimate the answer. Say, "Estimating will help you know if your answer is reasonable." Write the word **estimate** on the line beside first base.
 - Point to second base and tell students that using mental math skills will make their computation quicker and easier. Write **use mental math skills** on the line beside second base.
 - Finally, point to third base and discuss how checking computation can prevent errors. Write **check your work** beside third base.
 - When you have recorded the three steps, ask a student to read the three things we can do to help make sure that computation answers are correct.
2. Place the Estimation and Computation Review transparency on the overhead.
 - Look at problem 1 together:
 - Estimate:**
 - Remind students that the first thing we want to do is estimate the answer.
 - Briefly review the estimation strategies listed at the top of the page.
 - Ask a student to explain how they would estimate using one of these strategies.
 - Allow a variety of students to explain their thinking using different strategies. (For example, using compatible numbers a reasonable estimate would be 30 because 13 and 12 are both about 10 and the 7 and 2 would combine to equal about 10.)
 - Select one strategy and write its estimate on the line below problem 1.

Add

- Briefly review the mental math skills for addition listed at the top of the page.
- Remind students that the Commutative Property states that we can add in any order. Say, "We do **not** have to just start at the top or the bottom of a column of numbers. Instead we can use some of the skills we've learned to make adding easier."
- Have one student explain how they would mentally add the numbers in each column. (For example, for the ones column a student might say $7 + 3$ is a ten fact and $2 + 2$ is doubles (4). Ten and 4 is 14.
- Record the final answer. Ask students if the answer is reasonable based on their estimate.
- Ask students if there is more than one correct answer. (No) However, tell students that there **is** more than one way to think about the addition. Ask if anyone else would think a different way. Allow a few students to explain their thinking, emphasizing that there **are** different ways to think about an addition problem and students can choose the method that is easiest for them.

Check:

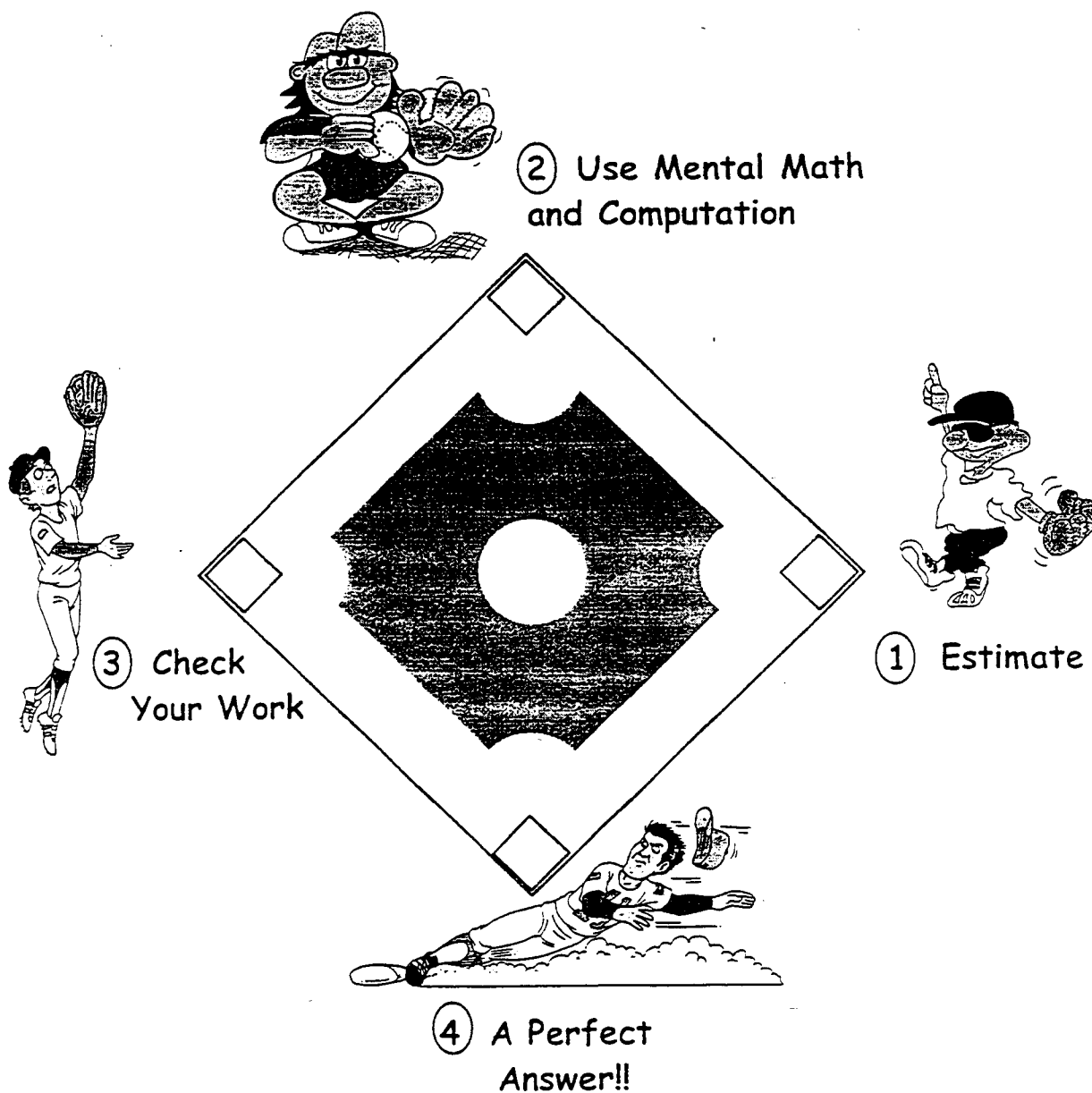
- Ask students if they can think of any way to check the answer to be sure that it is correct. Accept any reasonable suggestion, but lead students to understand that one way is to add the numbers mentally in a different order a second time.
 - Allow one student to add in a different order, explaining their thinking aloud.
 - Place a ✓ under the word "check" to show that it has been mentally added a second time.
- Continue to add or subtract the remaining problems out loud as a group, emphasizing the use of estimation, mental math, and checking. For subtraction problems, have students write an addition problem to check the answer. Actual and estimated answers for each problem are:

<div>1) $\begin{array}{r} 13 \\ 12 \\ 2 \\ + 7 \\ \hline 34 \end{array}$</div> <div>Check: ✓ (Added mentally a second time.)</div> <div>Estimate: (Compatible numbers) 30 (Rounding to nearest ten) 30 (Lead digit) 20</div>	<div>2) $\begin{array}{r} 14 \\ 32 \\ + 89 \\ \hline 135 \end{array}$</div> <div>Check: ✓ (Added mentally a second time.)</div> <div>Estimate: (Compatible numbers) 130 (Rounding to nearest ten) 130 (Lead digit) 120</div>
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<p>3) $\begin{array}{r} 5,624 \\ - 2,387 \\ + 650 \\ \hline 8,661 \end{array}$</p> <p><u>Check:</u> ✓ (Added mentally a second time.)</p> <p>Estimate: (Rounding to the nearest thousand) $\underline{9,000}$ (Lead digit) $\underline{7,000}$</p>	<p>4) $\begin{array}{r} 87 \\ - 29 \\ \hline 58 \end{array}$</p> <p><u>Check:</u> $\begin{array}{r} 58 \\ + 29 \\ \hline 87 \end{array}$ ✓ (Use addition to check subtraction.)</p> <p>Estimate: (Rounding to nearest ten) $\underline{60}$ (Lead digit) $\underline{60}$</p>
<p>5) $\begin{array}{r} 405 \\ - 98 \\ \hline 307 \end{array}$</p> <p><u>Check:</u> $\begin{array}{r} 307 \\ + 98 \\ \hline 405 \end{array}$ ✓ (Use addition to check subtraction.)</p> <p>Estimate: (Rounding to the nearest hundred) $\underline{300}$ (Lead digit) $\underline{400}$</p>	<p>6) $\begin{array}{r} 6,073 \\ - 129 \\ \hline 5,944 \end{array}$</p> <p><u>Check:</u> $\begin{array}{r} 5,944 \\ + 129 \\ \hline 6,073 \end{array}$ ✓ (Use addition to check subtraction.)</p> <p>Estimate: (Rounding to the nearest thousand) $\underline{6,000}$ (Lead digit) $\underline{6,000}$</p>

- Have students complete the Let's Practice! student activity sheet.

Slide Into Perfect Math Scores!



Estimation and Computation Review

Use estimation to see if answers are reasonable!

- Compatible Numbers
Look for combinations of 5, 10, or 100.
- Rounding
Find the "nearest" ten, hundred.....
- Lead Digit
Use the "front" digits.

Estimate, add or subtract, and check.

1)
$$\begin{array}{r} 13 \\ 12 \\ 2 \\ + 7 \\ \hline \end{array}$$

Estimate: - - - - -

2)
$$\begin{array}{r} 14 \\ 33 \\ + 87 \\ \hline \end{array}$$

Estimate: - - - - -

Learn to Compute Quickly → Use Mental Math!!

Addition

- Commutative Property
 $2 + 3 = 3 + 2$
- Zero Property
 $5 + 0 = 5$
- Add 1
 $7 + 1 = 8$
- Doubles
 $3 + 3 = 6$
- Sums to Ten
 $1 + 9 = 10, 2 + 8 = 10, \dots$
- Counting On
 $5, \dots, 6, 7, 8$
- Ten and More
 $7 + 5 = 7 + 3 + 2 = 12$

Subtraction

- Think Addition
 $8 - 5 = ?$ Think: $5 + \text{?} = 8$
- Zero Property
 $9 - 0 = 9$ $7 - 7 = 0$
- Take Nothing! Take all!
One Less Than/
Two Less Than
 $5 - 2 = 3$ $6 - 1 = 5$
- Subtraction With 10
 $10 - 8 = ?$
Think of a 10 fact. $(8 + 2 = 10)$

3)
$$\begin{array}{r} 5,624 \\ + 2,387 \\ \hline 650 \end{array}$$

Estimate: - - - - -

5)
$$\begin{array}{r} 405 \\ - 98 \\ \hline \end{array}$$

Estimate: - - - - -

4)
$$\begin{array}{r} 87 \\ - 29 \\ \hline \end{array}$$

Estimate: - - - - -

6)
$$\begin{array}{r} 6,073 \\ - 129 \\ \hline \end{array}$$

Estimate: - - - - -

Name: _____

Let's Practice!



1)

$$\begin{array}{r} 11 \\ 26 \\ + 4 \\ \hline \end{array}$$

Check:

Estimate

5)

$$\begin{array}{r} 5539 \\ 201 \\ + 61 \\ \hline \end{array}$$

Check:

Estimate

2)

$$\begin{array}{r} 4,305 \\ 7,815 \\ + 3,180 \\ \hline \end{array}$$

Check:

Estimate

6)

$$\begin{array}{r} 9,008 \\ - 5,644 \\ \hline \end{array}$$

Check:

Estimate

3)

$$\begin{array}{r} 649 \\ - 238 \\ \hline \end{array}$$

Check:

Estimate

7)

$$15 + 7 + 87 + 743 + 25$$

Check:

Estimate

4)

$$\begin{array}{r} 9300 \\ - 857 \\ \hline \end{array}$$

Check:

Estimate

8)

$$642 - 199$$

Check:

Estimate

Objective 12: Use a plan to solve problems adding and subtracting numbers.

Vocabulary

How many?
How many more....
left
more
brought
bought

Materials

Transparencies:

Problem Solving Plan (Problem Solving,
Vol. 2, Obj. 1)

Student Copies:

Using Computation to Solve Problems

Language Foundation

1. Check with the ESL teacher to find out to what extent students are familiar with the past tenses. A review may be important for some students.
2. Point out the difference between the past tense of to buy and to bring. On the activity sheet, students may need to be reminded that **bought** is past for buy; **brought** is past for bring.
3. Construction of interrogative sentences vary on the activity page. Some begin with "How many..." However, one begins with the past auxiliary, "Did...have...?" Students should be familiar with both constructions to understand the questions. As students progress through the curriculum, the problem solving unit will present other variations using question words and constructions.

Mathematics Component

Note: In this objective students will be using a plan to solve problems, while at the same time practicing addition and subtraction computation skills. You will need to refer to Problem Solving (Vol. 2) to find some of the pages being used in this lesson. The Problem Solving Plan is used to review the four steps of the problem solving process. Students will also be using either Problem Solving Plan A or Problem Solving Plan B. Plan A is provided for students who have very limited English language proficiency. Plan B is more structured and requires stronger command of English language skills.

1. Use a transparency copy of the Problem Solving Plan (Problem Solving Obj. 1) to review the four steps used to solve a problem.

Understand

- Remind students that there are three parts to **understanding** a problem.
- Read the first bullet which says “check words you don’t know.”
- Ask students how they sometimes find the meaning of new words. (Suggestions might include using a dictionary, asking a friend, asking the teacher, looking at visual or written clues, etc.)
- Read the second bullet which says “retell the problem in your own words.”
- Ask students what the phrase “in your own words” means. (It means you explain the problem again without looking at the original problem. You may say it a little differently; however, the **meaning** should be the same.)
- Read the last bullet which states “tell what the problem is asking.”
- Explain that sometimes it is hard to tell what a problem is asking because there are so many words. Say, “How can you tell that a sentence is asking a question?” (The sentence will have a question mark at the end.) Tell students that it is good to repeat the question before making a plan. That way, we **know** what the problem is looking for.
- Have one student retell the three steps to understanding a problem. (Find the meanings of words you don’t know, say the problem again without looking, and tell what the question is.)

Plan

- Have a short discussion on trips the students have taken where they had to make plans before going. Allow students to list some of the plans they made.
- Tell students that solving a problem is a little like taking a trip. For a trip, we might think about where we are going and decide what clothes to take. When we solve a problem, we look at the data and decide what to do with it. Remind students that later on, we will learn about some special kinds of strategies, or plans.

Solve

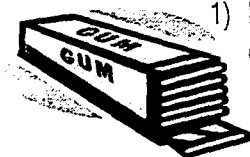
- Review the bullets that explain how to “Solve” a problem. Be sure to point out that solving a problem includes showing **how** you got the answer, not just writing the answer!

Look Back

- Remind students that “looking back” means checking to see if the answer **makes sense**.
 - Say, “How can you tell if an answer makes sense or is **reasonable**?” (Lead students to understand that estimating the answer before beginning and then comparing their answer to the estimate is one way to see if an answer makes sense.)
 - Ask “What should you do if your answer does not seem reasonable?” (Suggestions might include rereading the problem, checking their computation and their estimate, or trying to solve the problem a second way.)
2. The activity sheet Using Computation to Solve Problems, provides several problems which can be solved by adding and subtracting whole numbers.
- Choose a Problem Solving Plan (A or B) from Problem Solving Obj. 1 which seems appropriate for your students’ English language proficiency level.
 - Model the use of a plan by choosing one problem to work through together.
 - When students seem comfortable with the steps used in the problem solving process, they can begin to solve the other problems independently or in small groups.

Name: _____

Using Computation to Solve Problems



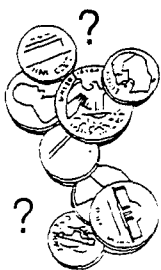
- 1) Miguel had 23 pieces of gum. He ate 10 pieces. Then he bought 8 more pieces of gum. How many pieces of gum does Miguel have now?

- 2) Aisha has 75 math problems for homework tonight. She has already done 29 problems. How many more problems does she have to finish ?



- 3) In October, Kim's family took a trip to the country to pick apples. He picked 143 apples from one tree and his Mom picked 70 apples from another tree. His Dad picked 97 apples and his brother picked 105 apples. How many apples did the family pick?

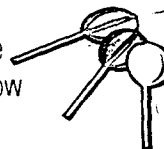
- 4) Our school theater has 520 seats. Mrs. Smith brought her class of 33 students to watch a science movie. Mr. Yang brought his 28 students. Mrs. Romero came with 35 students. How many seats were left in the theater for other students ?



- 5) Ling went to the store with 50¢. She bought a balloon for 18¢. Then she saw a chocolate cookie for 35¢. Did she have enough money left to buy the cookie?



- 6) Ann had 130 lollipops. Her brother ate 14 of them. Then she bought 25 more. Her sisters took 47 lollipops to school ! How many lollipops are left now ?



Objective 13: Use calculators to solve problems adding and subtracting whole numbers.

Vocabulary

calculate
calculator
keys
screen

Materials

student calculators

Student Copies:

Let Your Fingers Do the Walking!
Words, Numbers, Calculate!
Problem Solving with Calculators

Language Foundation

1. As students use the calculators to perform addition and subtraction operations, use and encourage them to use the word **calculate** with previously learned math vocabulary. For example, "Calculate the sum; calculate the difference." "How will you calculate the answer to this problem?" (add or subtract)
2. Review or explain the difference between a noun and a verb. **To calculate** is to perform the mathematical operation. **A calculator** is the machine used to perform the operation.
3. Some students may be familiar with the calculator; others may be learning for the first time. Point out the various terminology associated with use of the calculator, such as **keys** and **screen**, as students use them.

Mathematics Component

Note: The calculator is a legitimate and important tool for learning and doing mathematics. However, students and teachers have choices to make in the appropriate use of this piece of technology.

- Students need to learn to make sensible choices, using technology in situations where calculations are complex or numerous, but not relying on technology when answers are easily obtained or in places where they should have proficiency with the procedures.
- It is a good idea for teachers to make choices about the use of calculators in context as they are teaching various topics. The decision as to when or if calculators should be used depends on how they will help or hinder the intended mathematical objective. Access to calculators should not replace the need for students to learn and become fluent with basic arithmetic. However, calculators do provide computational support for problem solving, allowing students access to a wider range of complex problems earlier in their school experiences. Research has shown that calculators have a positive impact on the development of problem solving strategies and performance.

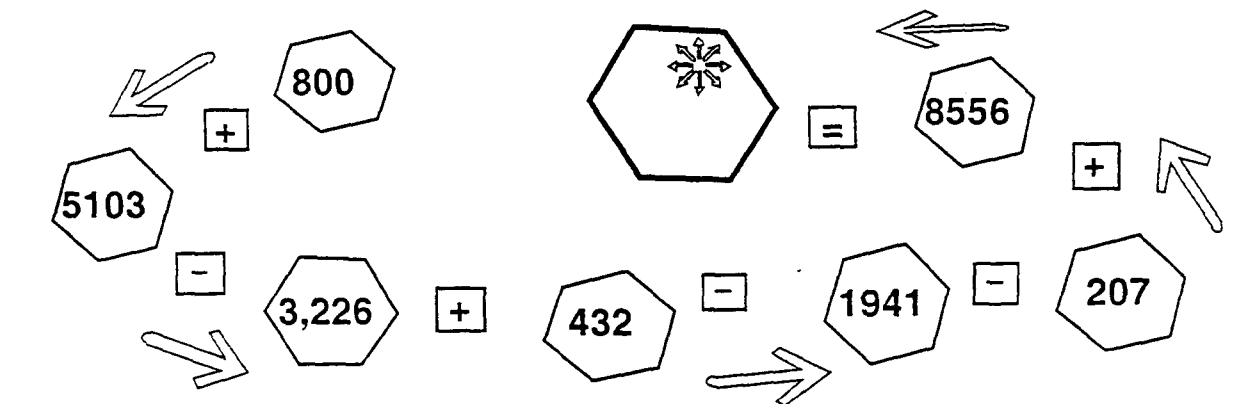
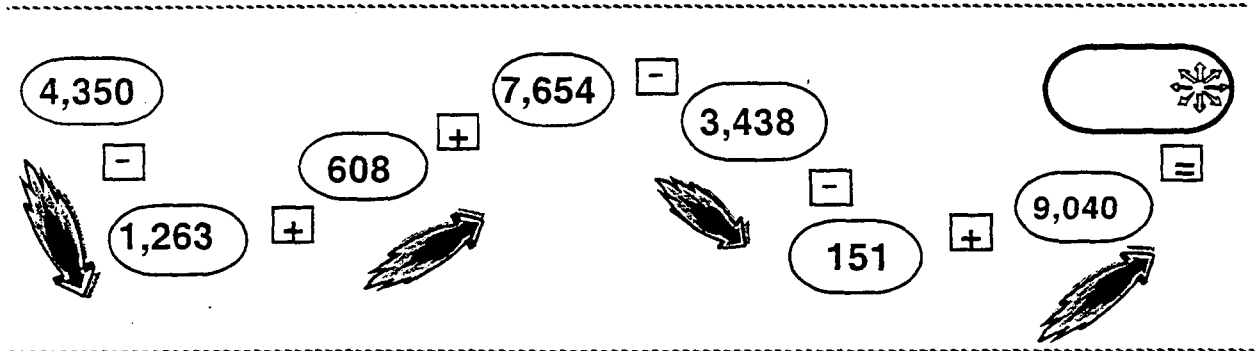
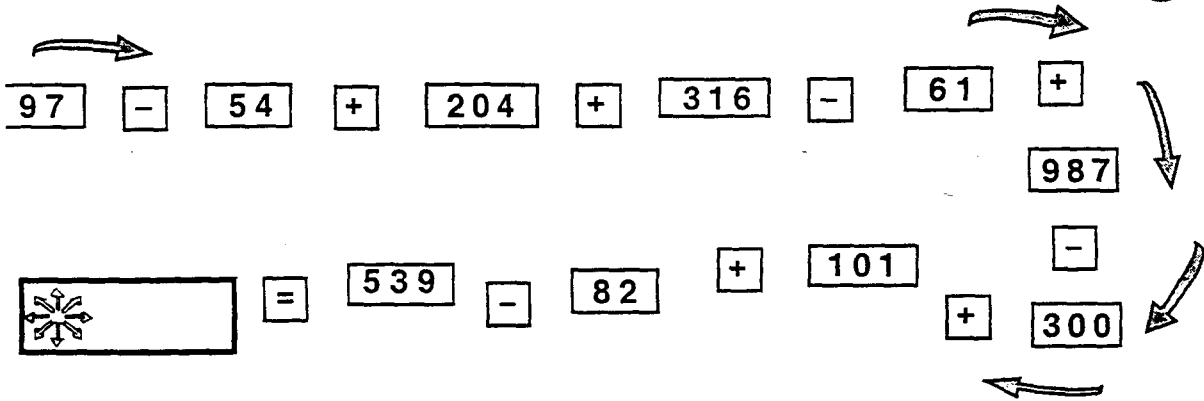
(Adapted from Principles and Standards of School Mathematics: Discussion Draft - NCTM - October, 1998)

1. This objective will focus on the use of calculators to solve problems adding and subtracting larger numbers.
 - Distribute individual student calculators.
 - Introduce basic operation keys. Also go over the equal sign and the keys used to clear the screen.
 - Choose two students to come up to the front of the class.
 - Tell the students that you will write an addition problem on the board.
 - Explain that both students are to find the exact answer to the problem. One student will use a calculator and must enter the whole problem into the calculator and display the answer on the screen. The other student may work the problem mentally.
 - Give one student a calculator and tell the other student to work the problem in their head. Say, "Raise your hand as soon as you know the answer. Here is the problem."
 - Write $2 + 2 + 2$ on the board.
 - The student working the problem mentally should be able to complete the problem first. If so, ask the class why they think the student without the calculator finished first. Lead students to understand that calculators are tools that we use when we can not easily do the work ourselves.
2. Distribute the activity sheets Let Your Fingers Do the Walking!, Words, Numbers, Calculate!, and Problem Solving with Calculators. Students will work independently or in small groups, using calculators to solve the problems.

Let Your Fingers Do the Walking!

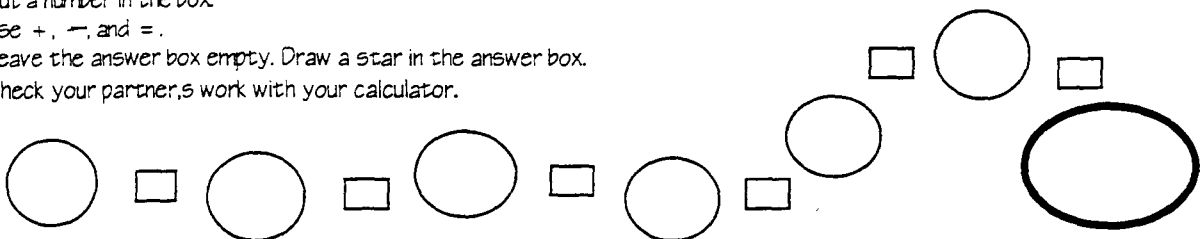


Follow the number road. Use a calculator to find the answer.
Write the answer in the star box at the end of the road.



Now, you make a number road for your partner to follow!

- Put a number in the box.
- Use +, -, and =.
- Leave the answer box empty. Draw a star in the answer box.
- Check your partner's work with your calculator.



Name: _____

WORDS, NUMBERS, CALCULATE !

Enter each number in your calculator. Enter the operation $+$ or $-$.
Then check your sum. Did you get the same answer?



- 1) Five hundred $+$
Nine thousand $+$
Three thousand, sixty-two $=$
CHECK NUMBER : 12,562

- 2) Six hundred twenty-nine $+$
Six hundred nine $+$
Six hundred $=$
CHECK NUMBER : 1,838

- 3) Seven hundred ninety $+$
Nine hundred seven $-$
One thousand, one hundred $=$
CHECK NUMBER : 597

- 4) Two thousand fifty-two $-$
Four hundred twenty-five $+$
Six thousand, seven hundred ten $=$
CHECK NUMBER : 8,337

- 5) Eight thousand, seventy-six $+$
Fourteen thousand, three hundred $+$
Ninety $=$
CHECK NUMBER : 22,466

- 6) Twenty thousand, one hundred five $+$
Two hundred two $-$
Twelve thousand, seven hundred six $=$
CHECK NUMBER : 33,013

Now write a number word problem of your own for your partner to solve.

- 7) _____ $+$

_____ $=$

CHECK NUMBER : _____

Name: _____



Problem Solving With Calculators

Roberto wants to buy a new car.



He makes a chart to help decide which kind of car he wants to buy.



Van

Truck

Family car

Cost of the car 	\$ 34,527	\$ 26,998	\$ 15,347
Gas for a year 	\$ 1,820	\$ 2,713	\$ 1,040
Total Cost of the Car			

1) Find the total cost for each:

The family car _____

The truck _____

The van _____

4) Gas would cost the most for which car? How much would gas cost if Roberto bought two trucks?

_____ \$ _____

2) Would Roberto spend more for the truck or the van? How much more?

_____ \$ _____

5) Roberto is very rich. He wants to buy all three cars! How much would he pay to buy them all?

3) What is the difference between the total cost of the family car and the truck?

6) Wow! Roberto bought the van, truck and family car! How much did he pay for the cars and gas in all?
